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BRITISH ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY

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Meetings of the Society are held regularly in London, at the rooms of the Royal Entomological Society, 41 Queen's Gate, London SW7 and the well-known ANNUAL EXHIBITION is planned for a Saturday in late October 1994 at Imperial College, London SW7. Frequent Field Meetings are held at weekends in the summer. Visitors are welcome at all meetings. The current Programme Card can be had on application to the Secretary, R. F. McCormick, at the address given below.

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Cover illustration: Larva of *Ctesias serra* (F.) (Coleoptera: Dermestidae), in spiders' webs under bark of old oak tree, Richmond Park. Photo: R. A. Jones.

NOTE: The Editor invites submission of photographs for black and white reproduction on the front covers of the journal. The subject matter is open, with an emphasis on aesthetic value rather than scientific novelty. Submissions can be in the form of colour or black and white prints or colour transparencies.

PARDASENA VIRGULANA (MABILLE)
(LEPIDOPTERA: NOCTUIDAE), A SPECIES NOT
PREVIOUSLY FOUND IN THE WILD IN BRITAIN

MARTIN R. HONEY

HARVARD
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AND MARK STERLING

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On 27.ix.1992 Mark Sterling joined John Phillips and David Young on a trip to search for *Gortyna borellii lunata* (Frey.) at a site on the edge of Hamford Water near Thorpe le Soken in Essex. A number of lights were run at the site, including a 15-watt actinic, which attracted a small noctuid which was initially misidentified as *Nycteola revayana* (Scop.). On closer inspection it had several unusual features, including bright white hind wings and hind legs. The specimen was therefore taken to the Natural History Museum where it was determined by Martin Honey as a female *Pardasena virgulana* (Mabille).

This species was originally described by Mabille (1880: xvii) as *Sarrothripa virgulana* and has also been known as *Giaura nigriscripta* Hampson. The species is listed by Hampson (1912: 245) and Gaede (1935: 181) as occurring in South and East Africa and Madagascar but there are specimens in the Natural History Museum collection from most tropical and non-tropical areas of Africa, including North Africa and certain Middle Eastern States, Cameroun, Comoro Islands, Ethiopia, Ivory Coast, Kenya, Madagascar, Malawi, Mauritius, Mozambique, Nigeria, Saudi Arabia, Sierra Leone, South Africa, Southern Yemen, Tanzania, Uganda, Zambia and Zimbabwe.

There is little published information on the natural foodplants of this species but there are specimens in the Natural History Museum collections reared from pigeon pea, *Cajanus cajan* (L.) (Leguminosae), and Lantana, *Lantana camara* (L.) (Verbenaceae). Larvae have also been previously imported into Britain on okra, *Abelmoschus esculentus* (L.) (Malvaceae) from Cyprus and on peas from East Africa. The latter were successfully reared at the M.A.F.F. laboratories at Harpenden. With the proximity of the collecting site to both Felixstowe and Harwich the most likely explanation for its occurrence in Britain is as a vagrant imported on a ship.

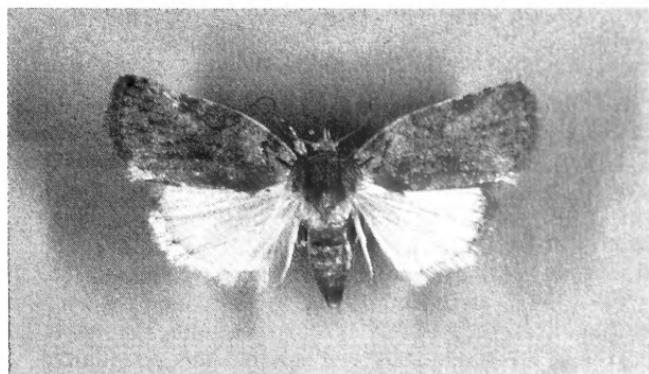


Fig. 1. *Pardasena virgulana*. This specimen was photographed at the 1993 BENHS Annual Exhibition and appears in colour on Plate II, Figure 3, *Br. J. Ent. Nat. Hist.* 1994; 7(3).

DESCRIPTION OF ADULT SPECIMEN

Wingspan 23 mm. Head and tegula fuscous mixed with white. Antennae simple, fuscous, segments of basal third ringed whitish. Underside of first and second segments of palpi brilliant white, upperside and all of third segment fuscous-tinged orange mixed with white. Thorax similar to head and tegula, but with less white. Upper surface of fore- and mid-legs fuscous with tawny and white scales, hindlegs bright shining white, foreleg tarsi ringed with white, foreleg femur covered with long scales. Underside of legs and body bright shining white. Forewing costa strongly arched towards base, termen rounded. Forewing colour white mixed fuscous, giving an overall grey appearance to the naked eye. The fuscous scales, especially towards the costa, have a tawny appearance. Costa edged with a small row of tawny orange scales. There is some black scaling at the base, forming a basal spot at the costa and extended into the wing to form a short black basal streak. An intermittent black fascia runs obliquely outwards from above (not touching) the dorsum towards (not touching) the costa, passing just beyond the end of the basal streak. There is an indistinct darker triangular area at mid-costa. Veins marked by dashes of black scales from about mid-way, those near the costa forming continuous black lines. Cilia light fuscous. Body fuscous. Hindwing shining white with fuscous terminal shade, veins fuscous. Cilia white, shading to whitish fuscous towards costa.

CLASSIFICATION

Pardasena virgulana (Mabille) falls within the noctuid subfamily Sarrothripinae. The only other British members of this subfamily are the two recorded species of *Nycteola*. If it is deemed necessary, an English vernacular name for this species already exists in the African literature (Pinhey, 1975), namely the 'grey square'.

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BOOK NOTICE

Tachinid flies. Diptera: Tachinidae, by R. Belshaw. *Handbk Ident. Br. Insects* 10(4ai). Royal Entomological Society of London, 1993, 170 pp, paperback, £20.— Not a rewrite of van Emden's 1954 *Handbook*, but a new book completely. The artificial key, of 60 pages, is illustrated with diagrams throughout. Ecological notes for each species are given in the central part of the book. Following the recent trend of the *Handbooks*, further illustrations are grouped together at the end. A new check list is included. Despite numerous books on the family, (Lundbeck, 1927; Wainwright, 1928 etc; Day, 1946, 1947; van Emden, 1954), the Tachinidae remain an under-worked group. As important lepidopterous (and other) parasitoids, the flies ought to be better studied, and perhaps Belshaw's book will enhance this possibility.

***SCLEROCONA ACUTELLUS (Eversmann)*
(LEPIDOPTERA: PYRALIDAE), THE SECOND
BRITISH RECORD**

P. J. BAKER

Mount Vale, The Drive, Virginia Water, Surrey GU25 4BP.

On the 13.vi.1989 I took from the garden light trap a pyralid which I did not recognise. Due to the pressure of work this was set aside and no attempt to identify it was made until late 1992. Early in 1993 the insect was finally identified as the second recorded specimen in Britain of *Sclerocona acutellus* (Eversmann).

Retzlaff and Wittland (1986) suggest that the larval pabulum is *Phragmites*, a plant which is quite common around the edges of gravel workings and ornamental lakes and along some stream sides within a 5-km radius of my garden in Thorpe/Virginia Water. No significant area of marshland including *Phragmites* communities is known from this area. Goater (1990) suggests a possible association of *S. acutellus* with low-lying damp sandy areas which dry out in summer. These areas include scrub and more open patches with species of *Carex*, *Scirpus*, grasses and a variety of herbaceous plants with *Phragmites* mainly along ditches. Such a habitat existed along the verges of the Thorpe bypass for several years after it was constructed in the early 1970s until the late 1980s when intensive cleaning up by the local council reduced the area to a characterless green roadside verge.

This year, 1993, an extensive search of *Phragmites* occurring within some 3 km of my garden was conducted and large samples of dead stems from the previous year as well as new growth were collected. A range of Lepidoptera associated with the reed was obtained but included no examples of *S. acutella*. More searches will be made in 1994 especially among the many *Phragmites* communities which will be destroyed when the local M25 is widened to fourteen lanes.

The possibility of some connection between this specimen and the first capture of this insect by Sterling (1989) less than a year earlier has to be considered. The Thorpe example could have been an accidental importation via the adjacent M25/M3 and Longstock is not that remote from an arterial road. Lack of other records seems to rule out migration but more examples need to be recorded before an informed conclusion can be suggested.

ACKNOWLEDGEMENTS

My thanks are due to Mr M. Schaffer of the Natural History Museum for his assistance with the identification of this insect and to Mr B. F. Skinner who very kindly provided details of recent relevant publications.

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SHORT COMMUNICATION

Xyleborus saxesenii (Ratzeburg) (Coleoptera: Scolytidae) new to Cornwall.—A single live specimen of *Xyleborus saxesenii* was found beneath the bark of a large beech trunk section lying in Higginsmoor Wood on the Lanhydrock Estate in E. Cornwall, 16.iii.1993. The beech lay alongside a well-used public path and had presumably been felled for “public safety” reasons. This is a new county record and a further extension of the known range. The nearest records known to me are from Gloucestershire (Atty, 1983), Cornwall (Duff, 1993) and in the far east of Dorset—Cranborne Chase (Pearce, 1926) and Wareham in 1991 (T. Winter, pers. comm.). It is clearly rare in these counties.

Higginsmoor Wood is a large area of oak- and beech-dominated woodland on the alluvial flats of the Fowey River. It appears to be ancient woodland and is therefore a rare example of ancient alluvial floodplain woodland—a type which has been extensively cleared for agriculture over the millennia throughout the British Isles.

Beech is believed not to be native in Cornwall, and the old beech of this particular estate undoubtedly originate from landscape plantings in the early 18th century. Although the favoured tree of *X. saxesenii* (in my experience, at least), this scolytid does also breed in a wide range of other tree species, and so its presence here does not contradict its recognized association with ancient woodland and pasture-woodland (Harding & Rose, 1986). The same beech timber also contained the beetles *Cerylon ferrugineum* Steph. and *Cylindronotus laevioctostriatus* (Goeze), and the bug *Xylocoris cursitans* (Fall.). Another scolytid, *Dryocoetus villosus* (F.), was abundant in the thick bark of a fallen oak branch close by, and I took a single specimen of *Selatosomus bipustulatus* (L.) on a riverside oak here in 1989. All of these appear to be good indicators of ancient woodland and pasture-woodland in Cornwall (Alexander, 1991, 1993), although only the last is recognized as such for Britain as a whole (Harding & Rose, 1986).

My thanks to Tim Winter for his comments on an earlier draft of this note.—K. N. A. Alexander, National Trust, 33 Sheep Street, Cirencester, Gloucestershire GL7 1QW.

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BOOK NOTICE

A review of the scarce and threatened Coleoptera of Great Britain. Part 2, by P. S. Hyman and M. Parsons, Peterborough, JNCC, 1994, 248 pages, paperback, £15 + £3 p. & p.—Families covered in this volume are: Cryptophagidae, terrestrial Hydrophilidae, Lathridiidae, Leiodidae, Nitidulidae, Pselaphidae, Ptiliidae, Scydmaenidae, Sphaeridiidae and Staphylinidae. There are also several pages of addenda to part 1. The beetles contained in this part of the review are the ‘difficult’ groups, and a footnote to every page states that the statuses of the species are open to debate because of the difficulty of identification. Nevertheless this is an extremely valuable and welcome book which, together with part 1, serves as a basis from which coleopterology in Britain can move forward.

THE TORSTENIUS COLLECTION OF SCANDINAVIAN LEPIDOPTERA

C. B. ASHBY†

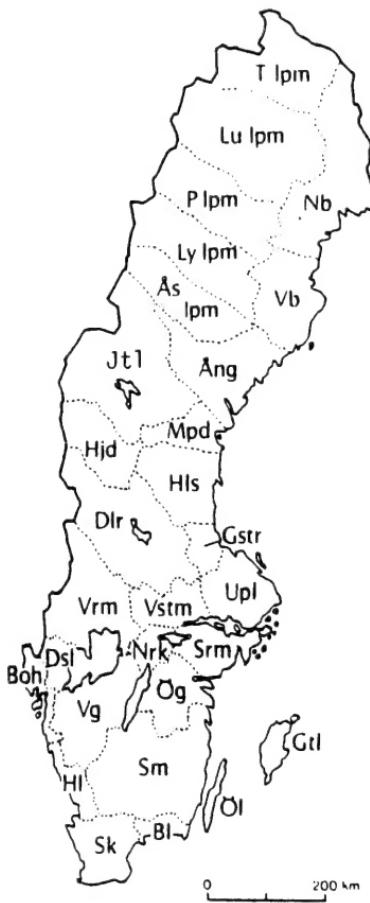
31 Tudor Close, Cheam, Sutton, Surrey SM3 8QT.

In parts of Scandinavia the western extension of the great European and Eurasian coniferous forest, the taiga, is the dominant habitat. Swamps, lakes, rivers and river deltas add diversity to these tall, dark forests of the north temperate zone. Travel northwards and you find the pines and spruces giving way to birch which, unlike elsewhere in Europe, forms the tree-line on the northern mountains. Beyond lies the treeless tundra and the Arctic Sea. Travel westwards across the rocky spine which separates Sweden from Norway to find the high altitude wilderness areas of the Dovrefjell, Jutonheimen and Hardangervidda. Travel eastwards to the shores of the land-locked Gulf of Bothnia and south to the Baltic and its thousands of islands, of which the largest are Öland and Gotland. The pastoral lowlands of Denmark and Skåne in Sweden are notable for their coastlines, lakes and marshes but give no hint of the vast areas of wild country and low population to which they give access.

Within the easily accessible literature, the diversity of butterflies in Scandinavia has been most ably presented by Howard and others in six papers in *The Entomologist's Record* between 1964 and 1976. The English translation of Henriksen and Kreutzer's useful book (1982) provides a comprehensive text and a wealth of coloured illustrations of the life histories and habitats of the Scandinavian butterflies. Kruys (1991) has given an account of the butterflies of Östergötland, one of the southern counties of Sweden, with notes of the habitat. The moths are well served for English readers by Skou's illustrated work (1986) on the Geometridae of Europe, and it is to be hoped that an English edition of his recent (1991) volume on the Noctuidae will follow soon. Kettlewell (1973) discussed in Chapter 6 of *The evolution of melanism* certain aspects of non-industrial melanism as illustrated by moths in Scandinavia, quoting numerous examples. Dr E. B. Ford, in his book *Moths* in the New Naturalist series (1955) has a valuable chapter on relict species and arctic-alpine faunas and refers to, among others, the three *Anarta* species which frequent the northern mountains and moorlands of Britain and Scandinavia. In Lapland, as Dr Guy Howard has pointed out (1969), the number of *Anarta* and closely related species rises to 13. Northern Scandinavia having much in common with northern Asia and North America at these latitudes, it is very likely that a significant number of its moths and butterflies could be shown to have a circumpolar distribution. Scandinavia, with its friendly, helpful people and its enormous range of habitats through 15 degrees of latitude, has much to offer the visiting naturalist.

When in Stockholm in June 1977, I had the good fortune to be introduced to Bankjuristen Stig Torstenius, a member of this Society and one of the leading lepidopterists in Sweden. I was invited to his home in Stocksund and spent an unforgettable evening going through what must be one of the major European collections of Lepidoptera in private hands. I came away with an astonishing offer: if the Society would accept it, Stig Torstenius would provide the material for a representative collection of Scandinavian macrolepidoptera, to be held at the Society's rooms, then at South Audley Street.

†Deceased.



Bl	= Blekinge
Boh	= Bohuslän
Dlr	= Dalarna
Dsl	= Dalsland
Gstr	= Gästrikland
Gtl	= Gotland
Hjd	= Härdedalen
Hl	= Halland
Hls	= Hälsingland
Jt1	= Jämtland
Lu lpm	= Lule lappmark
Ly lpm	= Lycksele lappmark
Mpd	= Medelpad
Nb	= Norrbotten
Nrk	= Närke
P lpm	= Pite lappmark
Sk	= Skåne
Sm	= Småland
Srm	= Södermanland
T lpm	= Torne lappmark
Upl	= Uppland
Vb	= Västerbotten
Vg	= Västergötland
Vrm	= Värmland
Vstm	= Västmanland
Ang	= Ångermanland
As lpm	= Åsele lappmark
Og	= Östergötland
OI	= Öland

Fig. 1. Provinces and Lapp-districts of Sweden.

Gaston Prior, then Secretary, and Eric Bradford, then Curator, were very ready to agree that this generous offer should be accepted, a view endorsed by the Council at its meeting in August of that year. At first two, and later three, 10-drawer Hill units were made available and by early October 1977 the first consignment of about 300 specimens was safely received. No time was to be lost if these were to be shown at the Annual Exhibition on 29 October, and in fact 159 species of 22 families were exhibited. This early flurry of activity was but the prelude to an extended period of assembling and cataloguing the material prior to curation. Two drawers were shown at the 1978 Exhibition and a further ten in 1979. By 1981, 20 drawers were installed at South Audley Street, the remaining 10 drawers following a year later. No material was sent by post or carrier, all the many consignments being brought over by Stig and myself and our families; by car, ship and air. Nothing was damaged.

Long runs, even of variable species, were at no time contemplated, the general plan being on the basis of two males and two females of each species. Some

rarities or immigrants were fewer than this, some valuable paratypes were more. About 900 species and subspecies, forming some 90% of the Swedish total, are represented. I have never counted up the number of specimens, but it must be between three and four thousand. As very little of this was withdrawn from the donor's main collection, most of it being specially prepared and set for the purpose from reserve and newly collected material, members can be in no doubt of the generosity and time-consuming effort involved.

The Society has in its library a major work on the Lepidoptera of Sweden: *Svenska Fjärilar* by Nordstrom, Wahlgren, Tullgren and Ljungdahl, published in Stockholm in 1941. This large, beautifully illustrated volume was invaluable in coming to terms with the significant number of species in the consignments which were not to be found in the normally accessible reference works in Britain. Inevitably, there were problems with the nomenclature. That in the three useful handbooks by Bertil Gullander (1971) which I acquired was frequently at variance with the revised Kloet and Hincks *Checklist* of 1972. But it was from the outset seen to be very desirable to produce a catalogue of the collection, and the full catalogue which eventually came into existence in 1982 was based on the best information to be held at the time. The label list of Bradley and Fletcher, which has been widely accepted since its appearance in 1979, was not available when curation of the collection began in earnest in 1978. The excellent label list published by T. W. Harman, being in conformity with Kloet and Hincks, was adopted for the first drawers and, rightly or wrongly, was continued for the remainder. Recognizing the rapid establishment of the Bradley and Fletcher list as the norm, the 1982 catalogue included the serial numbers of both lists.

Further material was added to the collection in 1984 and 1985, often the results of expeditions to remote parts of Scandinavia to collect species previously not represented. The enforced removal from South Audley Street led to the whole collection coming again under my roof, affording the opportunity to update the nomenclature, fill in gaps and add more new species. The catalogue is in course of revision to include these additions and the changes made necessary by the six (at least) major works on the Lepidoptera of Scandinavia which have appeared since the catalogue was written in 1982.

The data labels are a notable feature of the collection, being fully visible and of uniform presentation. Sweden, the country of origin of most of the material, is divided into 29 Lapp-districts and Provinces. Line 1 of each data label gives the standard abbreviation for the province (or county), line 2 the location, line 3 the date. Long (38-mm) continental pins are used throughout, so that all the information may be read without removing the specimen. Some of the material is from such outstanding areas of Norway as the Dovrefjell and the Jutonheimen, indicated on the labels by 'NO', the abbreviation for the Norwegian Nordland. The collection has been designed to have visual appeal, with fresh, unfaded material meticulously set, presenting a user-friendly introduction to a lepidopterous fauna largely drawn from the land of Linnaeus.

The list which follows is not the complete catalogue, copies of which may be had on loan from the Curator at the Pelham-Clinton Building, Dinton Pastures. It is a selection to highlight those species which are normally not to be found in the Society's other collections, and takes note of the changes in nomenclature. Where the genus has changed, the earlier generic name is given in brackets; where the specific name, or sometimes the whole name, has changed, the earlier usage is given as synonymy. Even the most cursory examination of the list will confirm that here, for perhaps the first time in Britain, is displayed in one fully accessible collection the remarkable diversity of species and forms inhabiting the highest

latitudes in Europe. It includes most of the notable species to which the literature draws special attention.

I am most grateful to Mr Barry Goater for his helpful comments and for his valued assistance with the recent changes in nomenclature.

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During the Society's move from the Alpine Club to its new headquarters at Dinton Pastures, the Torstenius collection was maintained and curated by Brad Ashby, allowing him to catalogue the collection and prepare this paper. The cabinets containing the collection are now at Dinton Pastures.

The following list of species is not a complete catalogue, rather it is a selection of interesting species, subspecies and races which will be of interest to British as well as European lepidopterists.

SELECTION OF SPECIES IN THE TORSTENIUS COLLECTION

Drawer 1

Hepialidae	6 spp.	<i>Gazorycta (Hepialus) fuscoargentea</i> B.-Haas; Torne lappmark.
Cossidae	2 spp.	<i>Lamellocossus (Cossus) terebrus</i> D. & S.; Uppland.
Zygaenidae	8 spp.	<i>Zygaena minos</i> D. & S. = <i>diaphana</i> Stdgr; Småland, Öland, Skåne. <i>Z. osterodensis</i> Reiss.; Uppland.
		<i>Z. exulans</i> Hochw. ssp. <i>vanadis</i> Palm.; Torne lappmark.
		<i>Z. viciae</i> D. & S. = <i>melioliti</i> Esp. ssp. <i>nigrina</i> Bgff.; Skåne.
Limacodidae	1 sp.	
Sesiidae	3 spp.	<i>Pennisetia (Bembecia) hylaeiformis</i> Lasp.; Uppland.

Drawer 2

Hesperiidae	11 spp.	<i>Carterocephalus silviculus</i> Meig.; Uppland. <i>Pyrgus alveus</i> Hübn. ssp. <i>scandinavicus</i> Strand; Gotland. <i>P. armoricanus</i> Ob.; Skåne. <i>P. andromedae</i> Wallgr.; Torne lappmark.
Papilionidae	3 spp.	<i>P. centaureae</i> Ramb.; Lappland, Ångermanland. <i>Parnassius apollo</i> L.; Uppland. <i>P. apollo</i> L. ssp. <i>linnaei</i> Bryk.; Gotland.
Pieridae	12 spp.	<i>P. mnemosyne</i> L. ssp. <i>romani</i> Bryk.; Uppland. <i>Papilio machaon</i> L. ssp. <i>bigenerata</i> Ver.; Gotland. <i>Colias hecla</i> Lefeb.; Torne lappmark. <i>C. nastus</i> Boisd.; Torne lappmark. <i>C. palaeno</i> L.; Torne lappmark, Dalarna.

Drawer 3

Lycaenidae	21 spp.	<i>Aporia crataegi</i> L.; Halland, Uppland. <i>Pieris napi</i> L. ssp. <i>bicolorata</i> Pet.; Lappland, Jämtland. ssp. <i>adalwinda</i> Fruhst.; Torne lappmark.
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Drawer 4

		<i>Lycaena helle</i> D. & S.; Ångermanland, Jämtland. <i>Heodes virgaureae</i> L.; Uppland, Skåne. ssp. <i>oranula</i> Fr.; Norrbotten.
		<i>Palaeochrysophanus hippothoe</i> L. spp. <i>stiberi</i> Gerh.; Lappland. ssp. <i>euridice</i> Rott.; Skåne. ssp. <i>hippothoe</i> L.; Uppland.
		<i>Lycaeides idas</i> L.; Uppland, Dalarna. f. <i>lapponicus</i> Gerh.; Torne lappmark.
		<i>L. argyrogonomon</i> Bergstr.; Småland.
		<i>Aricia nicias</i> Meigen ssp. <i>scandica</i> Wahl.; Hälsingland, Gästrikland.
		<i>Albulina orbitulus</i> de Prunner; Jämtland; also a series from Norway in Drawer 5.
		<i>Eumedonia eumedon</i> Esp.; Uppland. ssp. <i>praticola</i> Burr.; Gotland. ssp. <i>borealis</i> Wahl.; Norrbotten.
		<i>Agriades glandon</i> de Prunn. ssp. <i>aquilo</i> Boisd.; Torne lappmark.
		<i>Vacciniina optilete</i> Knoch.; Uppland, Närke. ssp. <i>cyparissus</i> Hüb.; Torne lappmark.

Drawer 5

		<i>Plebicula dorylas</i> D. & S.; Skåne, Öland, Gotland. <i>Plebicula (Agrodiaetus) amanda</i> Schn.; Öland, Uppland, Dalarna.
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Drawer 5 (cont.)**Nymphalidae**

31 spp.

Cyaniris semiargus Rott.; Uppland, Skåne.
Glaucopsyche alexis Poda ssp. *schniederi* Stdgr.; Gästrikland.
Maculinea alcon D. & S. ssp. *rebeli* Hirshke; Skåne.
Scolitantides orion Pall.; Uppland.
Euphydryas (Hypodryas) maturna L.; Uppland.
E. iduna Dalman; Torne lappmark.

Drawer 6

Fabriciana niobe L.; Södermanland, Uppland.
Brenthis ino Rott.; Jämtland, Gästrikland, Uppland.
Boloria napaea Hffsgg.; Torne lappmark, Jämtland.
B. aquilonaris Stichel; Torne lappmark, Jämtland, Uppland.

Drawer 7

Proclossiana eunomia Esp.; Torne lappmark, Dalarna, Ångermanland.
Clossiana freija Thunb.; Torne lappmark.
C. polaris Boisd.; Torne lappmark.
C. thore Hübn. ssp. *borealis* Stdgr.; Torne lappmark.
C. frigga Thunb.; Torne lappmark, Lule lappmark.
C. improba Butler ssp. *improbula* Bryk.; Torne lappmark.
C. chariclea Schneider; Torne lappmark.
Melitaea diamina L.; Uppland, Skåne.
Mellicta britomartis Assm.; Gästrikland, Uppland.

Drawer 8**Satyridae**

20 spp.

Lasiommata maera L.; Uppland.
L. petropolitana F. ssp. *ominata* Krul.; Södermanland.
Lopinga achine Scop.; Gotland.
Erebia embla Thunb.; Lule lappmark, Dalarna.
E. pandrose Borkh.; Torne lappmark, Härjedalen.
 ssp. *lappona* Thunb.; Torne lappmark.
E. disa Thunb.; Torne lappmark.
E. ligea L.; Gästrikland, Uppland.
 ssp. *dovrensis* Strd.; Torne lappmark.
E. medusa D. & S. ssp. *polaris* Stdgr.; Finnmark, Norway.
Oeneis norna Thunb.; Torne lappmark.
O. bore Schn.; Torne lappmark.
O. jutta Hübn.; Lule lappmark, Dalarna, Uppland.
Coenonympha hero L.; Dalarna.
C. arcania L.; Uppland.

Drawer 9**Lasiocampidae**

13 spp.

Eriogaster arbustulæ Freyer; Härjedalen, Hjerkinn (Norway).
Dendrolimus pini L.; Uppland.
Cosmotriche (Selenephera) lunigera Esp.; Torne lappmark, Södermanland.

Saturniidae

2 spp.

Aglia tau L.; Skåne

Lemoniidae

1 sp.

Lemonia dumi L.; Uppland.

Drawer 10**Drepanidae**

6 spp.

Drepana curvatula L.; Skåne.

Thyatiridae

9 spp.

Achlya flavicornis L. ssp. *finmarchica* Schöy; Jämtland.

Geometridae

301 spp.

The systematic treatment of the Geometridae is contained in drawers 11–16. These were made up in 1978. Late additions (17 species) are in drawer 10.

Drawer 10 (cont.)

Scopula decorata D. & S.; Gotland.
Eulithis testata L. ssp. *insulicola* Stdgr.; Norrbotten.
Ecliptopera capitata H.-S.; Uppland.
Selenia dentaria F., arctic form; Torne lappmark, Norrbotten.
Lycia lapponica Boisd.; Norway.

Drawer 11

Jodis putata L.; Västerbotten, Gästrikland, Södermanland.
Cyclophora quercimontaria Bastelb.; Uppland.
Rhodostrophia vibicaria Cl.; Gästrikland, Uppland.
Scopula incanata L.; Öland, Medelpad, Uppland.
Idaea pallidata D. & S.; Ångermanland, Gästrikland, Uppland.
I. deversaria H.-S.; Skåne.
Lythria rotaria F. = *purpuraria* L.; Öland, Skåne.
 ssp. *sordidaria* Zett.; Skåne.

Drawer 12

Xanthorhoe abrasaria H.-S.; Torne lappmark.
X. annotinata Zett.; Torne lappmark.
Epirrhoa pupillata Thunb.; Uppland.
E. hastulata Hübn.; Norrbotten, Uppland.
Entephria polata Dup.; Torne lappmark.
E. byssata Aur.; Torne lappmark.
E. nobiliaria H.-S.; Torne lappmark.

Drawer 13

Chloroclysta infuscata Tengst.; Torne lappmark, Uppland.
C. latefasciata Stdgr.; Uppland.
Thera serraria Lien. & Zell.; Torne lappmark.
Colostygia aptata Hübn.; Hälsingland.
C. turbata Hübn.; Torne lappmark.
Horisme aquata Hübn.; Skåne.
Rheumaptera subhastata Nolck.; Torne lappmark, Jämtland.
Malacodes regelaria Tengstr.; Uppland, Södermanland.
Perizoma minorata Treits. f. *borealis*; Torne lappmark.
P. parallelolineata Retz.; Uppland.
Psychophora sabinii Kirby; Torne lappmark.
Baptria tibiale Esp.; Jämtland. (Drawer 16)

Drawer 14

Eupithecia analoga Djak. = *bilunulata* Zett.; Jämtland,
 Gästrikland.
E. actaeata Wald.; Uppland, Södermanland.
E. orphnata W. Pet.; Öland.
E. sinuosaria Evers.; Småland, Östergötland.
E. gelidata Mosch. = *hyperboreata* Stdgr.; Torne lappmark.
E. innotata Hufn.; Öland, Skåne.
E. conterminata Lien. & Zell.; Uppland, Södermanland.
E. lanceata Hübn.; Uppland.
Aplocera praeformata Hübn.; Finland.
Lithostege farinata Hufn.; Skåne.
Nothocasis (Trichopteryx) sertata Hübn.; Skåne.

Drawer 15

Archanna melanaria L.; Uppland, Gästrikland.
Semiothisa signaria Hübn.; Uppland.

Drawer 15 (cont.)

Itame (Semiothisa) loricaria Evers.; Hälsingland.
Pygmaena fusca Thunb.; Torne lappmark, Jämtland.
Hypoxystis pluviaaria F.; Uppland.

Drawer 16

Peribatodes secundaria D. & S., Skåne.
Gnophos obfuscata D. & S. = *myrtillata* Hübn.;
 Uppland.
Parietaria vittaria Thunb. = *Gnophos sordaria* Thunb.; Torne
 lappmark.

Drawer 17

Sphingidae 10 spp.

Drawer 18

Notodontidae 28 spp. *Notodonta torva* Hübn.; Dalarna, Uppland.
Odontosia sieversi Mén.; Uppland.
Pterostoma palpina Cl. ssp. *lapponicum* Teich.; Norrbotten.
Pygaera timon Hübn.; Småland.
Closteria (Pygaera) anastomosis L.; Skåne.
 Thaumetopoeidae 1 sp. *Thaumetopoea pinivora* Treits.; Gotland.

Drawer 19

Lymantriidae 11 spp. *Teia (Orgyia) ericae* Germ.; Skåne.
 Arctiidae 32 spp. *Calliteara (Dasychira) abietis* D. & S.; Uppland.
Setina (Endrosa) roscida D. & S.
Eilema lutarella L.; Uppland, Gotland.
Setema (Eilema) cereola Hübn.; Västmanland.

Drawer 20

Ctenuchidae 1 sp. *Pararctia (Hyphoraia) lapponica* Thunb.; Torne lappmark.
Hyphoraia aulica L.; Skåne.
 Nolidae 6 spp. *Grammia (Orodemnias) quenseli* Payk.; Torne lappmark.
Dysauxes ancilla L.; Öland.
 Noctuidae 349 spp. *Nola karellica* Tengst.; Gästrikland.
 The systematic arrangement of the Noctuidae is contained
 in drawers 21–30 (1979). Late additions (12 species) are
 accommodated in drawer 20.
Agrotis luehri sp. n. Mentzer & Moberg (see References).
 Paratypes (6): Leirdalen, Norway.
Catocala pacta L.; Gotland.

Drawer 21

Euxoa recussa Hübn.; Uppland.
E. adumbrata Evers.; Öland.
E. vitta Esp.; Gotland.
Opigena polygona D. & S.; Uppland, Gotland, Öland.
Actinotia hyperici D. & S.; Östergötland.
Chersotis cuprea D. & S.; Uppland, Västmanland.
Epipselia (Rhyacia) grisescens F. ssp. *septentrionalis* Fibiger;
 Uppland.
Spaelotis clandestina Harris = *suecica* Aur.; Gästrikland.
Coenophila (Eugrapha) subrosea Steph. ssp. *subcaerulea*
 Stdgr.; Västmanland.

Drawer 22

Xestia tecta Hübn.; Torne lappmark.
X. kongsvoldensis Grönlein; Torne lappmark.
X. alpicola Zett. ssp. *hyperborea* Zett.; Torne lappmark.
X. ashworthii Doubl. ssp. *burraui* Nord.; Öland.
 ssp. *jutonensis* Schöy.; Uppland.
X. collina Boisd. ssp. *kenteana* Stdgr.; Värmland.
X. lyngei Rebel = *Archana lankialai* Grönblom;
 Torne lappmark.
X. (Anomogyna) laetabilis Zett.; Torne lappmark.
X. distensa Evers.; Norrbotten.
X. gelida Sparre-Schneider; Torne lappmark.
X. rhaetica Stdgr.; Hälsingland.
X. borealis Nordstr.; Torne lappmark.
X. speciosa Hübn.; Uppland.
 ssp. *arctica* Zett.; Torne lappmark.
Anomogyna caecimacula D. & S.; Uppland.

Drawer 23

Protolampra (Cerastis) sobrina Dup.; Uppland, Västmanland.
Mesogona oxalina Hübn.; Halland.
Lasionycta leucocycla Stdgr. = *Lasiestra dovreensis* Wocke;
 Torne lappmark; Nordland (Norway).
Polia (Anarta) richardsoni Curt.; Torne lappmark.
P. lamuta Herz = *Anarta asiatica* Stdgr. ssp. *rangnowi* Püng.;
 Torne lappmark.
Sympistis heliophila Payk. = *melaleuca* Thunb.;
 Torne lappmark.
S. lapponica Thunb.; Torne lappmark.
S. zetterstedti Stdgr.; Torne lappmark.
S. funebris Hübn.; Torne lappmark, Lule lappmark.
Anartomima sedescens Walk. = *bohemanni* Stdgr.;
 Torne lappmark.
Lasionycta skraelingia H.-S., Torne lappmark.
L. proxima Hübn.; Uppland.
Eriopygodes imbecilla F.; Gästrikland.

Drawer 24

Hadena filograna Esp. = *filigrama* Esp. ssp. *xanthocyanea*
 Hübn.; Öland.
Cucullia argentea Hufn.; Skåne.

Drawer 25

Cucullia lucifuga D. & S.; Östergötland.
Hillia iris Zett.; Lycksele lappmark; Nordland (Norway).
Lithophane consocia Borkh. = *ingrica* H.-S.; Ångermanland,
 Uppland.
Stauropora (Calotaena) celsia L.; Östergötland, Uppland.

Drawer 26

Polymixis (Antitype) gemmea Treits.; Uppland, Södermanland.
P. polymita L.; Uppland.
Conistra rubiginosa Scop. = *vau-punctatum* Esp.; Uppland,
 Östergötland.
Agrochola nitida D. & S.; Öland, Uppland.

Drawer 27

Acronicta cuspis Hübn.; Uppland.
Cryphia raptricula D. & S.; Uppland.
Amphipyra perlflua F.; Småland.

Drawer 28

Apamea mailliardi Gey. ssp. *schildei* Stdgr.; Nordland (Norway).
 See Goater and Mikkola in references.
A. zeta Treits. ssp. *marmorata* Zett.; Nordland (Norway).
 See Goater and Mikkola in references.
A. lateritia Hufn.; Uppland, Öland.
A. furva D. & S.; Uppland, Öland.
A. illyria Freyer; Uppland, Södermanland, Småland.
A. rubrirena Treits.; Uppland.
Hydraecia nordstroemi Horke; Uppland, Öland.
Calamia tridens Hufn.; Gotland, Halland.

Drawer 29

Phragmitiphila (Nonagria) nexa Hübn.; Närke.
Platyperigia montana Brem. = *Caradrina cinerascens* Tengst.;
 Uppland.
Paradrina (Caradrina) seleni Boisd.; Uppland.
Athetis gluteosa Treits.; Norway, Gotland.
A. lepigone Mosch. ssp. *fennica* Ndsm.; Västerbotten.
Eublemma minutata F. = *noctualis* Hübn. ssp. *egestosa* Drt.;
 Skåne.
Nycteola degenerana Hübn.; Uppland, Södermanland.
Panthea coenobita Esp.; Skåne.
Macdunnoughia confusa Steph.; Uppland, Södermanland.
Lamprotes c-aureum Knoch; Skåne.

Drawer 30

Autographa macrogamma Evers.; Norrbotten.
A. mandarina Freyer; Uppland (Drawer 20).
Syngrapha microgamma Hübn.; Södermanland.
S. hochenwarthii Hochw.; Norway.
S. diasema Boisd.; Norway.
Abrostola asclepiadis D. & S.; Öland, Uppland.
Lygephila viciae Hübn.; Södermanland, Östergötland.
Polypogon (Herminia) tentacularia L.; Uppland (Drawer 20).
P. tentacularia L. ssp. *modestalis* Heyd.; Torne lappmark.
Paracolax tristalis F. = *Herminia glaucinalis* D. & S.; Uppland.

IN MEMORIAM

We regret to announce the death of Mr C. B. Ashby, shortly after the receipt of this article in January 1994. Mr Ashby was a trustee of the BENHS and an active member. The funeral, at which the Society was represented, was held on 21 January. A full obituary will appear in a future issue of the Journal.

SHORT DISTANCE FORM FREQUENCY DIFFERENCES IN MELANIC LEPIDOPTERA ACROSS HABITAT BOUNDARIES

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The evolution of industrial melanism in the peppered moth, *Biston betularia* (L.), is considered to be a classic example of evolution in action. The primary selective agent involved has been shown to be differential bird predation, the melanic morph f. *carbonaria* being more cryptic in heavily polluted regions, but less cryptic than the typical form in relatively unpolluted areas (Kettlewell, 1955a, 1956). Mani (1990) has successfully shown by computer simulation that fitness differences between the forms estimated from bird predation experiments provide good agreement with geographic differences in the frequencies of the forms, at least on a coarse scale.

Recent work on melanic polymorphism in other species of Lepidoptera has shown that the frequencies of melanic forms may change abruptly and significantly over very short distances across habitat boundaries. Kearns and Majerus (1987) showed that the frequencies of melanic forms of *Alcis repandata* (L.) and *Semiothisa liturata* (Clerck), taken in a moth trap under a close plantation conifer canopy, in Dyfed, Wales, were significantly higher than in a moth trap some 50 yards away in open deciduous woodland. Similar results have subsequently been obtained for *Agriopsis marginaria* (F.) (Majerus, 1989) in Hampshire, *A. repandata*, *Peribatodes rhomboidaria* (D. & S.) and *Idaea versata* (L.), in Surrey (Jones *et al.*, in press), and *Chloroclysta truncata* (Hufn.), *Thera obeliscata* (Hübner), *Thera firmata* (Hübner) and *Noctua pronuba* L., in Gloucestershire (Aldridge *et al.*, 1993).

We here provide data from a short period of moth trapping at Box Hill, Surrey showing that morph specific frequency differences over short distances occur in many, but not all, species of moth with melanic forms. In so doing we extend the list of species in which significant habitat-related frequency differences have been recorded, and provide the first data showing species in which such differences do not occur.

METHODS

Trapping was carried out from 22.vi to 2.vii.1992, between approximately 21.30 p.m. and 1.00 a.m., in Juniper Bottom, Box Hill, Surrey.

Juniper Bottom is an east-west running valley with mature yew woodland along its sides. The canopy of the wood is extremely dense leading to a very dark under-canopy with virtually no ground cover, except under occasional broad-leaf trees, such as whitebeam, and below breaks in the canopy caused by the blowdowns of October 1987. This sparse ground cover consists mainly of dog's mercury.

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The bottom of the valley is separated from the yew slopes by a sharply defined, thick, mixed broad-leaf natural hedge. This provides a sharp habitat boundary between the darkness inside the wood and the light of the open valley floor. The valley floor is characterized by short, partly rabbit-cropped, chalk grassland. (For further details of the vegetation types see Jones *et al.*, 1993.)

The traps used were 100-W mercury vapour discharge bulbs set on 'dustbin' traps. They were set in pairs across the habitat boundary approximately 27 m apart and with 77 m between each pair.

Nine species with melanic forms were scored as typical, half-melanic, melanic or dark banded according to morph phenotype. For *Apamea monoglypha* (Hufn.), which displayed continuous variation, the morphs were graded from 1 to 5, lightest to darkest respectively, using representative standard individuals of each class for comparison. Similarly, for *Hydriomena furcata* (Thunb.), many different morphs were seen. They were recorded according to colour (yellow, green or pink), pattern (speckled or banded), strength of pattern and whether they were melanic, half-melanic or typical (absence of large areas of black). For statistical analysis only melanic, half melanic and typical classes were considered. The numbers of three species, *N. pronuba*, *Craniophora ligustris* (D. & S.) and *B. betularia* were too small for any meaningful analysis to be performed or deductions to be drawn, and results for these three are not included.

RESULTS AND ANALYSIS

The results for six species are given in Table 1. The data were analysed using heterogeneity chi-squared analysis. (The chi-squared test determines the probability

Table 1. The numbers of moths of different forms of six species taken in yew woodland or in chalk grassland at Juniper Bottom from 22.vi to 2.vii.1992. Data from the three traps set each night in the yew woodland are totalled. Similarly the data from the three traps set in chalk grassland each night are totalled.

<i>Peribatodes rhomboidaria</i>		Typical		Melanic		Total
Yew woodland		85		66		151
Chalk grassland		46		8		54
<i>Alcis repandata</i>	Typical	Half-melanic	Melanic	Banded		Total
Yew woodland	47	97	16	13		173
Chalk grassland	43	39	11	5		98
<i>Ectropis bistortata</i>	Typical	Half-melanic	Melanic			Total
Yew woodland	17	5	6			28
Chalk grassland	35	2	5			42
<i>Idaea aversata</i>		Unbanded		Banded		Total
Yew woodland		34		13		47
Chalk grassland		17		3		20
<i>Apamea monoglypha</i>	Darkest	← Class →		Lightest		
Yew woodland	5	4	3	2	1	Total
Chalk grassland	1	0	10	4	2	17
	2	2	13	9	0	26
<i>Hydriomena furcata</i>	Typical	Half-melanic	Melanic			Total
Yew woodland	22	5	25			52
Chalk grassland	27	8	18			53

that a particular deviation, in an observed data set, from the expectation based on a scientific hypothesis, for example that the frequencies of typical and melanic *P. rhomboidaria* should be the same in yew woodland and chalk grassland, could occur by chance sampling error.) The comparisons tested, the chi-squared values, degrees of freedom and corresponding probabilities are given in Table 2.

The data from *P. rhomboidaria* and *A. repandata* confirm the findings of Jones *et al.* (1993). In *P. rhomboidaria*, significantly more melanics were taken under the yew canopy than in the chalk grassland. (In this context, significant is used as a technical statistical term, meaning that the likelihood that a particular deviation from expectation is less than one in twenty, if the usual significant level (*P*) of 0.05 is set.) In *A. repandata*, the relative frequencies of the half-melanic, melanic and banded forms were homogeneous in the two habitats, with the frequencies of all three being higher under the yew canopy than in chalk grassland. However, the frequency of the typical form when compared to the three darker morphs was significantly higher in the chalk grassland than under the yew canopy.

In the case of *I. versata*, the frequency of the banded form was higher in the yew traps than in the chalk grassland traps, but not significantly so. However, the data are not significantly different from those obtained by Jones *et al.* (1993), when trapping at Juniper Bottom, in 1990 (data given in Table 3 for convenience) either under the yew ($\chi^2_1 = 0.070$; $P > 0.05$), or in the chalk grassland ($\chi^2_1 = 0.700$; $P > 0.05$).

The frequencies of darker forms (half-melanic and melanic) of *Ectropis bistortata* (Goeze) were significantly higher inside the yew woodland than in the chalk grassland.

Conversely, the frequencies of the darker grades (classes 3, 4 and 5) of *A. monoglypha*, did not differ significantly from those of the paler grades in the two habitats. In *H. furcata*, the frequency of full melanics in the yew traps was

Table 2. Analysis of data, giving chi-squared (χ^2) values, degrees of freedom (d.f.) and probabilities (*P*) (ns = non-significant).

	χ^2	d.f.	<i>P</i>
<i>P. rhomboidaria</i>			
Typical vs melanic, yew vs grass:	14.40	1	<0.001
<i>A. repandata</i>			
All forms, yew vs grass:	9.352	3	<0.05
Melanic vs half-melanic, yew vs grass:	1.610	1	ns
Melanic + half-melanic vs banded, yew vs grass:	0.064	1	ns
Melanic + half-melanic + banded vs typical, yew vs grass:	7.869	1	<0.05
<i>E. bistortata</i>			
Melanic + half-melanic vs typical, yew vs grass:	4.500	1	<0.05
<i>I. versata</i>			
Typical vs banded, yew vs grass:	1.237	1	ns
<i>A. monoglypha</i>			
Classes 1+2 vs classes 3+4+5, yew vs grass:	0.002	1	ns
<i>H. furcata</i>			
Typical + half-melanic vs melanic, yew vs grass:	2.157	1	ns

Table 3. Numbers of two forms of *I. versata* taken in paired m.v. light traps at Juniper Bottom, Box Hill, Surrey, 22.vi-6.vii.1990. Traps of a pair were sited 20 m apart, one inside and one outside mature yew woodland. (From Jones *et al.*, 1993.)

	Unbanded	Banded	Total
Inside yew	51	27	78
Outside yew	23	3	26

The banded form is the nominate form. The unbanded form is f. *remutata*.

Test of unbanded vs banded, inside vs outside yew woodland: $\chi^2 = 5.05$, $P < 0.05$.

higher than in the chalk grassland, the converse being the case for both the typical and half-melanic classes, but the differences were very slight.

DISCUSSION

Jones *et al.* (1993) suggested two possible causes for the presence of higher frequencies of melanic and dark banded forms under dark canopies than in more open habitats. Either, as a result of selective predation by birds in the past, morph-specific habitat preferences have evolved so that their degree of crypsis and thus protection from visually hunting predators is maximized. Alternatively, in the absence of such preferences, continual bird predation, by eliminating light forms in dark habitats, and dark forms in open habitats, may maintain the frequency differences year on year. Several authors make the assertion that the latter is an unlikely explanation because the level of differential bird predation would have to be very high to maintain abrupt frequency differences over such short distances (Majerus, 1989; Jones *et al.*, 1993; Aldridge *et al.*, 1993). However, Jones (1993) has shown that sharp clines in morph frequencies may be maintained by relatively weak differential bird predation, as long as dispersal distances are not high.

Aldridge *et al.* (1993) put forward a third hypothesis, namely that differential habitat selection has evolved for reasons not associated with bird predation and the degree of crypsis. They note, as a possibility, that the night temperature would generally be higher under closed woodland canopies than in the open. As the degree of irradiation from a surface is at least in part dependent on its colour, a dark surface radiating heat faster than a pale one, they suggest that melanics may be at a disadvantage if they fly in cooler more open situations. However, in this context it must also be pertinent to ask why some species appear not to show morph-related habitat selection.

While the data available are not sufficient to allow more than speculation on the three alternative explanations of the data, consideration of the origin and genetic control of melanism in the species which do, and those which do not show abrupt frequency differences, may be informative. In all the species in which sharp morph frequency differences over short distances have been recorded previously, the melanism is thought to be controlled by one or two genetic loci, and to be of relatively ancient origin (Jones *et al.*, 1993; Aldridge *et al.*, 1993). This is significant because Howlett (1989) has demonstrated that morph-specific behavioural differences will take substantial amounts of time to evolve. The likelihood of morph-specific habitat preferences evolving will thus increase with time, and be more frequent in species in which melanism is of relatively ancient origin.

In *E. bistortata*, Kettlewell (1973) cites melanism as being '? industrial', from a number of sites in southern England and Wales. The inheritance of melanism

is not noted, but progeny from a number of crosses suggest that half-melanics and melanics are controlled by separate single loci, with their respective alleles both dominant to the typical alleles (Majerus, unpublished). Jones (1993) questions Kettlewell's suggestion that melanism in *E. bistortata* is industrial in origin, noting the occurrence of melanic individuals from a number of rural regions.

In both *A. monoglypha* and *H. furcata*, Kettlewell (1973) reports the existence of ancient, non-industrial melanics. In neither species has the inheritance of the colour pattern variation been analysed, but the continuous variation in *A. monoglypha* is likely to be under polygenic control, with the darkest form, f. *aethiops* Tutt (not present in the Juniper Bottom samples), possibly being due to a single gene showing incomplete dominance (Kettlewell, 1973). In *H. furcata* preliminary analysis suggests at least five gene loci are involved, three of these respectively controlling ground colour, flecking, banding, and two affecting melanism (Majerus, unpublished data). That the genetic control of melanism in the two species which do not show sharp morph-specific frequency changes is more complex than that in any of the species which do show this phenomenon, raises the possibility that the mode of inheritance of melanism, as well as its time origin, may be important in the evolution of morph-specific habitat preferences. If the mechanism by which a particular type of behaviour (such as actively preferring a particular habitat) becomes associated with a specific phenotype is because the genes controlling the behaviour and the phenotype are tightly linked, as suggested by Howlett (1989), such linkage may only be possible if melanism is controlled by one or two gene loci. In species where melanism is controlled polygenically, it may be that morph-specific habitat preferences and morph-specific resting site preferences can only evolve if choice is made through a mechanism such as Kettlewell's (1955b) contrast-conflict hypothesis of resting site selection. That is to say if a moth's behaviour is dependent on its own perception of its phenotype.

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SHORT COMMUNICATION

***Bryoporus rugipennis* Pandellé (Coleoptera: Staphylinidae) in Northern England.**—This rare montane beetle is mostly known from the north of Scotland, but it has also now been found at three English localities. Day (1923) mentions a record by Donisthorpe from Skiddaw, and K. Houston collected four females in pitfall traps at Cow Green, Upper Teesdale, County Durham in 1967 and 1968. The site is now under the reservoir. These four were identified for Houston by R. C. W. in 1974, but the record has never been published. Two were found in “*Calluna* grassland on glacial drift overlying Melmerby Limestone” (NY814303), the other two in *Festuca ovina* L. grassland (NY814303). The traps were in operation from late May to late July.

More recently, a single specimen was found by K. N. A. A. in an area of blanket peat bog at 670 m on the summit ridge about Scar Crags (NY207206), to the west of Causey Pike in the Derwent Fells, Cumbria, 29.vii.1992. The vegetation here is of a typical undegraded high level blanket bog type, with a good cover of the dwarf shrubs *Calluna vulgaris* (L.) Hull, *Vaccinium myrtillus* L., and *Empetrum nigrum* L., plus some *V. vitis-idaea* L., within a matrix of *Eriophorum* and *Juncus squarrosus* L.

The information gathered for the forthcoming *Review of the scarce and threatened Coleoptera of Great Britain, Part 2* (Mark Parsons, pers. comm.) so far includes recent Scottish records only from Mid-Perth, S. Aberdeen, Easterness and Wester Ross vice-counties, with older records additionally from Stirlingshire and Elgin. Another unpublished record known to R. C. W. is of three taken in water traps by David Horsfield on 11.vii.1982, at Meall a'Chrasgaith (NH186734) Fannich Hills SSSI, Wester Ross. The traps were placed on “rocky *Rhacomitrium* health” at 883 m altitude. It is also worth noting that R. C. W. never came across *B. rugipennis* himself during several years of intensive collecting in the Cairngorms and sorties to many other Scottish peaks. R. C. W. also identified all the Staphylinidae collected by R. Goodier in Snowdonia and no specimens of *B. rugipennis* were discovered.

K. N. A. A. would like to thank John Owen for his identification of the specimen of *B. rugipennis* and Mark Parsons for access to the as yet unpublished national review.—Keith N. A. Alexander, National Trust, 33 Sheep Street, Cirencester, Gloucestershire GL7 1QW, and R. C. Welch, Institute of Terrestrial Ecology, Monks Wood, Abbots Ripton, Huntingdon, PE17 2LS.

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THE CURRENT STATUS OF THE LESSER MOTTLED GRASSHOPPER, *STENOBOTHRUS STIGMATICUS* (RAMBUR) ON THE ISLE OF MAN

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The discovery of the lesser mottled grasshopper, *Stenobothrus stigmaticus* (Rambur), on the Isle of Man in 1962 was a surprise (Ragge, 1963). Although present in Northern France, the Low Countries and Scandinavia, the grasshopper has not been recorded from any other site in the British Isles. The mystery of the origin of the population on the Isle of Man is discussed by Ragge (1963, 1965) and Burton (1965, 1990). A more immediate practical concern, however, is the lack of quantitative information on the grasshopper's habitat requirements on the island. In 1990, a proposal to extend an existing golf course over much of the grasshopper's site highlighted the importance of such basic data. In late July of that year I visited the island to assess the situation at first hand (Cherrill, 1990), returning in early August 1993 to review subsequent developments. This article reports on these field visits and makes tentative suggestions for the species' conservation.

IDENTIFICATION OF *S. STIGMATICUS*

S. stigmaticus is an inconspicuous green grasshopper, with brownish wings. The most obvious characteristics separating it from other members of the British fauna are its small size and the presence of a tooth on each valve of the ovipositor in females (Ragge, 1965; Marshall & Haes, 1988). In the British Isles, the latter characteristic is shared only by females of *Stenobothrus lineatus* (Panz.) which measure 17–23 mm in length, compared to a length of 12–15 mm for adult females of *S. stigmaticus*. The dimensions of a number of grasshopper specimens collected by the author on the Isle of Man in July 1990 are shown in Table 1. Although the numbers of specimens of each species are low, it is evident that the small overall size of *S. stigmaticus* can be attributed largely to its relatively short wings. Along other dimensions, *S. stigmaticus* is as large or larger than co-occurring specimens of *Myrmeleotettix maculatus* (Thunb.). Both species are considerably smaller than the common field grasshopper, *Chorthippus brunneus* (Thunb.).

DISTRIBUTION

On the Isle of Man, the grasshopper occurs solely on and in the vicinity of the Langness Peninsula which forms the South Eastern tip of the island. The peninsula, which is approximately 2.5 km long and 0.5 km wide, supports a number of historical landmarks including the Sea Mark (usually called the Herring Tower), the Powder House, ancient earthworks and a working lighthouse (Fig. 1). With the exception of a raised beach and small areas of sand-dune and salt-marsh on its western side, the peninsula's shore-line is steeply rocky. The peninsula is renowned for its aesthetic appeal and is an important site for breeding birds. The peninsula lies within an ornithological reserve, but otherwise neither the peninsula nor the grasshopper currently enjoys special protection under Manx law.

The landward half of the peninsula is dominated by a golf course on sand-dunes and blown sand. The seaward portion supports substantial outcrops of slate,

Table 1. Mean linear dimensions of adult grasshoppers collected on Langness Peninsula in July 1990 (all measurements in mm, with standard deviation in parentheses).

Species	Sex	n	Head	Pronotum	Fore-wing	Hind-femur	Body
<i>M. maculatus</i>	M	5	1.96 (0.16)	2.16 (0.15)	8.33 (0.66)	7.20 (0.54)	12.45 (0.94)
	F	14	2.28 (0.11)	2.50 (0.12)	10.14 (0.48)	8.37 (0.42)	14.92 (0.57)
<i>S. stigmaticus</i>	M	12	1.91 (0.21)	2.20 (0.12)	6.76 (0.28)	7.37 (0.48)	10.88 (0.41)
	F	14	2.39 (0.11)	2.88 (0.14)	8.24 (0.62)	9.11 (0.60)	13.51 (0.71)
<i>C. brunneus</i>	M	12	2.22 (0.19)	2.17 (0.21)	12.54 (0.41)	9.29 (9.55)	17.46 (0.64)
	F	11	3.07 (0.24)	3.62 (0.17)	15.77 (0.78)	12.20 (0.65)	22.46 (0.90)

former agricultural land (now reverting to rough grassland) and extensive areas of unimproved vegetation (Garrad, 1972; Allen, 1984). The latter include maritime grassland and heath. In addition to supporting a diversity of invertebrates (Luff, 1990), these plant communities are of some conservation value in their own right.

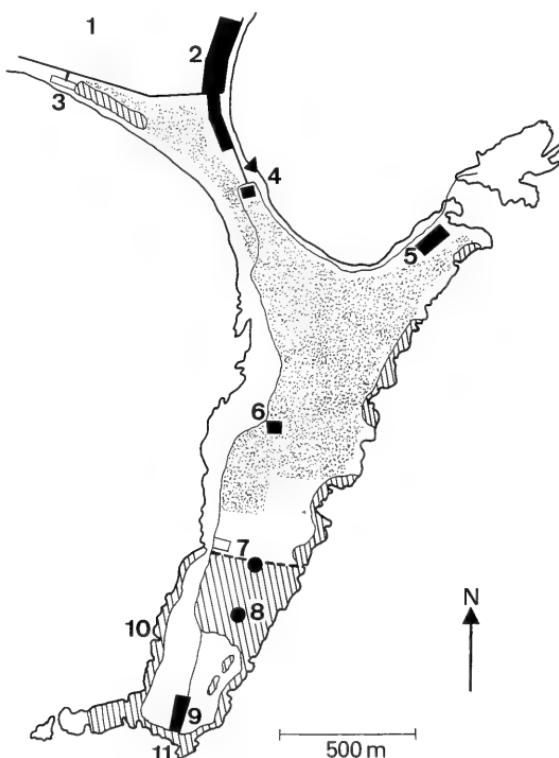


Fig. 1. Map of Langness Peninsula, showing the distribution of *S. stigmaticus* in July 1990 (hatched areas), the golf course (stippled areas) and other features mentioned in the text: 1 Ronaldsway airport; 2 Derby Haven; 3 Sandwich; 4 Kiln and Smelt House (ruins); 5 Hotel; 6 Langness Farm (ruins); 7 car park (open symbol), earthwork (broken line) and Powder House (filled circle); 8 Herring Tower; 9 Lighthouse; 10 The Arches; 11 Dreswick Point.

In the European context, the *Ulex gallii/Calluna vulgaris* heath is a scarce vegetation type (NCC, 1989).

Happily, in 1990, I found the grasshopper to be widely distributed over the peninsula. Although most areas of maritime grassland and heath were occupied, densities appeared to be greatest in the seaward half of the peninsula, and especially around rocky outcrops. In the landward half of the peninsula, the grasshopper occurred only along the eastern edge of the golf course, where maritime turf and heath were restricted to a narrow strip of rocky outcrops and slopes above the shore. Here, and elsewhere, the grasshopper occurred on the edges of cliffs and to within several metres of high water. Evidently, the species is tolerant of vegetation receiving considerable quantities of sea spray. However, in contrast to its occurrence in these exposed conditions, the grasshopper was apparently absent from the golf course and areas of tall grassland in the centre of the peninsula (including areas of former arable land).

Isolated colonies recorded previously (Burton, 1965) on the edge of the golf course near Derby Haven could not be located. However, in some measure of compensation, the grasshopper was found in a narrow strip of fore-dune (measuring roughly 200 m by 20 m), sandwiched between the golf course and the shingle beach at Sandwick in Castletown Bay (Fig. 1). This site represents the first record of *S. stigmaticus* landward of the peninsula's narrow neck.

Due to the proximity of Sandwick to Ronaldsway Airport, and the uncertainty as to the species' origin on the island, the opportunity was taken to search the abandoned Second World War hangar areas, runway aprons and grasslands within the airport's perimeter. A careful search of the southern coastal fringe between Douglas Head (OS grid reference SC382742) and The Chasms (SC192665) was also undertaken (Cherrill, 1990). Both searches, conducted in July 1990, drew a blank, despite ideal weather and seemingly suitable vegetation at many sites. The three other species of grasshopper recorded from the island were widespread. Of these, *M. maculatus* and *C. brunneus* were found to occur with *S. stigmaticus* on the peninsula and at Sandwick. The third species, *Omocestus viridulus* (L.), was recorded in the vicinity of Derby Haven in the late 1960s (Dr Garrad pers. comm.), but now seems to be absent from the areas occupied by *S. stigmaticus*.

Overall, my observations on the distribution of *S. stigmaticus* were encouraging, with the species occurring more widely than was previously thought. Nonetheless, closer consideration of the species' habitat requirements suggests that there may be little cause for complacency amongst those seeking to secure the future of the grasshopper on the Isle of Man.

HABITAT REQUIREMENTS

In Continental Europe, *S. stigmaticus* occurs in a range of habitats, including sheep pasture, moorland and woodland glades. However, only the driest, warmest sites with short turf are occupied (Harz, 1975; Bellmann, 1988; van Wingerden & Bongers, 1989; van Wingerden *et al.*, 1991a, 1991b, 1992). Holst (1986) notes that *S. stigmaticus* occurs at sites similar to, but warmer and drier than, those favoured by the congeneric species, *S. lineatus*. This observation serves to emphasize the curious isolation of *S. stigmaticus* on the Isle of Man, because in Britain *S. lineatus* is restricted to Southern England. Nonetheless, the ecological requirements of *S. stigmaticus* at Langness and in Continental Europe appear to be broadly similar.

My observations on Langness peninsula suggest that *S. stigmaticus* is never found far from short turf (usually less than 5–10 cm tall) and reaches high densities only

where extensive areas of such turf are present (often with a mixture of sparse grass tussocks or heather bushes). Areas dominated by heather (*Calluna vulgaris* (L.) Hull) and *Erica cinerea* L.) and western gorse (*Ulex gallii* Planchon) were occupied, but densities appeared to be lower than in more open grassy areas. Densities were particularly high in short maritime turf on the Arches, and along the shore south of the lighthouse at Dreswick Point. Towards the centre of the peninsula densities were greatest around slate outcrops (and especially near the Powder House). At Sandwick the grasshopper occupied an area of short turf, again with only a scattering of grass tussocks.

The floristic composition of the vegetation occupied by *S. stigmaticus* differed greatly between Sandwick and the peninsula, yet its distribution in relation to sward height appeared to be similar. Information on sward structure is difficult to convey without quantitative data. In these circumstances, the distribution of *S. stigmaticus* can perhaps be described most effectively via comparison with the better known habitat preferences of the two co-occurring species, *M. maculatus* and *C. brunneus*. The former species is known to occur exclusively within areas of very short turf (Marshall & Haes, 1988), while the requirements of *C. brunneus* are more complex. The early juvenile stages of *C. brunneus* occur predominantly in areas of short turf, while the later stages are associated with tussocky grass (Richards & Waloff, 1954; Atkinson & Begon, 1988). In comparison with these two species, *S. stigmaticus* was observed to be intermediate in its habitat preferences. Thus, while *S. stigmaticus* was associated with patches of short turf, this relationship was not as pronounced as that exhibited by *M. maculatus*. Conversely, *S. stigmaticus* was rarely found in the taller vegetation occupied by adult *C. brunneus*.

If my interpretation of the species' habitat requirements is correct, the species' absence from short turf on the golf course requires explanation. The most likely cause is the disturbance associated with maintenance of the fairways and playing activity. It is possible that an intensive search of the 'rough' would reveal small colonies surviving on remnants of heath, but the golf course as a whole appears to offer a sub-optimal habitat for *S. stigmaticus*.

THREATS TO THE SPECIES' SURVIVAL ON THE ISLE OF MAN

In 1990 a proposal for the extension of the existing Langness golf course into the seaward section of the peninsula was rejected at public enquiry. Whilst many long-established golf courses are valuable wildlife refuges (NCC, 1990), the applicants' submission that wildlife may actually benefit from the further development of Langness peninsula (RPS Clouston, 1990) gained little credence. Despite this judgement, the future of the lesser mottled grasshopper is yet to be secured unequivocally. By the time the inspector's decision was given, the owners of Langness had already ceased livestock grazing on the peninsula several years previously. At the time of my visit in August 1993, this traditional means of managing the vegetation of the peninsula had not been reinstated with the result that many areas of turf, which supported *S. stigmaticus* in 1990, now appeared to be too tall for the species. Unfortunately, poor weather in 1993 prevented a direct reassessment of the species' distribution.

At Sandwick, and along the rocky shores of Langness peninsula, environmental conditions alone may be sufficient to maintain an open sward of low growing plants. Towards the mid-line of the peninsula, however, *S. stigmaticus* appears vulnerable to shading from unchecked growth of the vegetation. In the continued absence of grazing, the build up of dead plant material presents an additional risk from uncontrolled heath fires.

THE FUTURE

In conclusion, the little information available suggests that ensuring the continued presence of *S. stigmaticus* on the Isle of Man will require careful monitoring of both the species' distribution and the state of its habitat. Preliminary field observations at Langness, indicate that the species' primary requirements is for areas of short turf, perhaps interspersed with sparse tussocks or heather clumps. At the time of writing, grazing has yet to be reinstated and the future management of Langness is uncertain. Resolution of the problem hinges on the success of long-running negotiations between Manx National Heritage (the island's governmental body with responsibility for nature conservation) and the owners of Langness.

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BOOK REVIEW

Hoverflies, by Francis S. Gilbert, with plates by Steven J. Falk, 67pp, 68 half-tone figures & line drawings, 4 colour plates, *Naturalist's Handbooks* 5, Revised 2nd edition, Richmond Publishing Co Ltd, Slough, 1993, ISBN 0-85546-266-8, paperback, £7.95, ISBN 0-85546-256-6 hardback, £13.—This book was well received when originally published by Cambridge University Press in 1986. The new revised edition is very similar; in the acknowledgements the author refers to the opportunity to correct mistakes and the adding of some of the more interesting discoveries in the last few years.

Among the extra information is that on p. 7 which refers to the possible use of *Eristalis* as indicators of pollution, citing an example of such a project in Egypt, but giving no advice as to the pollution thresholds of British species. Since the previous paragraph refers to the larvae using the foulest of foul water, which is true of *E. tenax*, the reader is left unaware that some (most/all?) British *Eristalis* species breed in natural eutrophic conditions that are unpolluted by man. On p. 9 the over-wintering biology of *Eristalis tenax* is a useful addition.

Under *Volucella* (pp. 14-16), the reader is briefly told that the larvae show a range of key evolutionary innovations which led to the evolution of other genera. In the next chapter, on p. 17, there is a short new paragraph on the evolution of hoverflies, with references.

New ecological information is given, as on p. 23 where the discovery of larvae of *Callicera rufa* is mentioned. At the end of chapter 4, p. 36, there is reference to new work on the effectiveness of mimicry.

Just over 18 pages are devoted to the identification of selected common species as in the first edition, complemented by four colour plates; the tone of the plates is different from my copy of the first edition but the quality is overall much the same. The final chapter, on techniques, is essentially the same. The first edition had a compilation of 85 references to hoverflies; the revised edition has 95.

For anyone with the first edition of this book, it would not be worth buying the second edition since the revision is minor. The book remains a useful one for the target audience, especially students and the general naturalist.

SOME RARE AND THREATENED BEES RECORDED FROM SALISBURY PLAIN, WILTSHIRE

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INTRODUCTION

Salisbury Plain is located in south Wiltshire, extending westwards from the county's eastern border to Westbury and Warminster, and from the Vale of Pewsey 10 miles south to the vicinity of Amesbury. Except for a few small villages, the western half of the region is sparsely inhabited, the main centres of population being the army garrisons. The Plain is about the same size as the Isle of Wight, with vast tracts of countryside designated as the Salisbury Plain Training Area (S.P.T.A.), the property of the Ministry of Defence (M.o.D.), and used primarily as artillery ranges and for training personnel. Much of the area consists of chalk grassland, with scrub and isolated plantations. The S.P.T.A. encompasses the largest remaining piece of semi-natural chalk grassland in Europe (37,651 ha.) (McOmish & Field, 1993). Some of the grassland is mown annually for hay in late June and early July, an activity which unfortunately coincides with the peak flight period of several of the rarer bees in these areas, as many pollen and nectar sources are removed.

Possibly because of its M.o.D. administration (permits are required for access to the ranges), the region has been largely neglected by entomologists. Our recent survey has shown that Salisbury Plain has a very rich aculeate fauna (especially comprising those species characteristic of calcareous grassland), and includes a number of nationally rare or threatened species. The latter includes the bees *Mellita dimidiata* Mor. and *Nomada armata* H.-S., both of which are accorded RDB1 status (i.e. they are categorized as nationally endangered species in the insect Red Data Book (Else & Spooner, 1987) and *A review of the scarce and threatened bees, wasps and ants of Great Britain* (Falk, 1991). In Britain *M. dimidiata* is known only from a few grassland sites in Wiltshire.

In the period 1983–85 a thriving population of *M. dimidiata* was found by G. R. Else and M. Edwards on chalk grassland near Easton Royal in the Vale of Pewsey. A subsequent search in this site on 25.vi.1989 by both authors revealed only a single male. None was encountered on further visits by us, the most recent in June 1993. The bee had been found here first by K. M. Guichard on the 29.vii.1972 (Guichard, 1973). This site is a small, isolated cutting, consisting of a footpath and an adjacent steep grassy slope; the area is surrounded mainly by 'improved' sheep pasture (a euphemism for artificially fertilized grassland which is deficient in most plants characteristic of chalk downland). The population crash seems to have been due to rabbits which had eaten many of the sainfoin (*Onobrychis vicifolia* Scop.) plants on which this bee solely relies for both pollen and nectar. Encouragingly this plant had fully recovered to its former abundance by June 1993.

The depressing decline of this bee prompted us, in 1991, to undertake a survey of the four sites (all on Salisbury Plain) where the species had also been found in the past, and to investigate other grassland sites on the Plain where sainfoin was well established in the hope of finding further populations of *M. dimidiata*. As a result, over the three seasons 1991–93, a most encouraging picture of the fortunes of this

bee emerged. Indeed the species is proving to be well established over a wide area of Salisbury Plain, and here it is clearly not endangered. The survey also revealed the presence of other scarce bees on Salisbury Plain and should provide a basis on which conservation measures for these can be implemented if considered appropriate in the future. Preliminary results of some of the species encountered are presented below as an annotated list. We plan to continue with this survey in future seasons.

SCARCE BEES RECORDED FROM THE SALISBURY PLAIN, 1949–1993

Hylaeus cornutus Curt. (Colletinae). This is a rare species, restricted to the south-central and south-eastern counties of England, the range extending from Kent to Dorset, northwards to Wiltshire, Berkshire, Oxfordshire, Northamptonshire, Cambridgeshire, Suffolk and Norfolk (Else, in prep.). It has been reported from open, broad-leaved woodland, fenland and chalk grassland. A male of this bee was collected from an oxeye daisy (*Leucanthemum vulgare* Lam.) flower on Tilshead Down by G. M. Spooner on the 14.vi.1974. A female was collected from scentless mayweed (*Tripleurospermum inodorum* Schultz Bip.) blossom on Figheldean Down (between Netheravon and North Tidworth) on 22.vii.1993 by S. P. M. R., and two other females on wild carrot (*Daucus carota* L.) inflorescences by G. R. E. on Great Cheverell Hill (a chalk downland reserve of the Wiltshire Wildlife Trust near West Lavington) on 21.viii.1993. These records seem to be the only ones known from the county. The national flight period of this single-brooded species extends from June to August.

Andrena hattorfiana (F.) (Andreninae). This is one of the largest of British *Andrena* species and is widely distributed but very local in southern Britain. Its range extends from east Kent to west Cornwall, northwards to Wiltshire, Oxfordshire, Surrey, Essex, Northamptonshire, Cambridgeshire, Suffolk and Norfolk; there are also old records from South and West Glamorgan (Else, in prep.). Until recently there were very few records from Wiltshire. C. H. Andrewes collected single specimens of *A. hattorfiana* in or near Salisbury on 11.vii.1947 and 31.vii.1948, and from his garden at Coombe Bissett (west of Salisbury) on 25.vii.1974. One of us (G. R. E.) found many specimens near Easton Royal from 1983 to 1985. Several were also recorded by G. R. Else and M. Edwards on the roadside at Cow Down, north of North Tidworth, on 7.vii.1985. During the course of our survey we found the bee on seven sites on Salisbury Plain. These are summarized (from west to east) as follows: Great Cheverell Hill, Tilshead (several places), near the Bustard vedette, Bulford, Figheldean Down (including the roadside), Weather Hill (south of Everleigh) and Cow Down. Both sexes are almost exclusively associated with the flowers of field scabious (*Knautia arvensis* (L.)), a plant characteristic of the grasslands of Salisbury Plain. We have occasionally found individuals visiting small scabious (*Scabiosa columbaria* L.) (including a female collecting pollen) and greater knapweed (*Centaurea scabiosa* L.) flowers. Nest burrows of the bee have been found in wheel ruts along a track near Tilshead (these included a small, loose aggregation of five burrows) and another in a soil exposure on the edge of a field. The rarer red-marked form of the female is not uncommon on the Plain, perhaps comprising 30% of the female population in some sites. Nationally, the flight period is from late June to mid August.

A. marginata F. Males of this species were observed visiting the flowers of small scabious on Figheldean Down on the 14.vii.1993 (apparently the first Wiltshire records of this bee). Females were found here on 19 and 22.vii.1993. Several females were also encountered on roadside flowers of the same species at Weather Hill on 20 and 31.vii. This is a rare and local bee, but is very widely distributed in the British Isles,

ranging from Kent to west Cornwall, northwards to Gloucestershire, Northamptonshire and Norfolk; it is known too from Wales, central Scotland and southern Eire (Else, in prep.). The species is mainly associated with scabious flowers: small scabious, devil's-bit scabious (*Succisa pratensis* Moench) and field scabious. The flight period in the British Isles of this single-brooded species is from mid July to late September.

A. nitidiuscula (Schck). This is a very local bee in Britain, known from East Sussex to east Devon (and including the Isle of Wight), Surrey and Berkshire (Else, in prep.). It has been mainly found on the coast, but is also known from heathland and open, broad-leaved woodland. The bee is associated with the flowers of various species of Apiaceae. The first Wiltshire record was a female found by S. P. M. R. near Tilshead on 19.viii.1991. In July and early August, 1993, a thriving nesting aggregation of this bee was observed by us on an exposed track on Figheldean Down. Females foraged nearby on wild carrot blossom; some males visited yellow Asteraceae flowers. A pair was found in copula on the ground within the nesting area on 7.viii. In Britain the species is single-brooded and is active from the end of June to early September.

Interestingly, many *Nomada rufipes* F. were observed in the vicinity of this nesting aggregation, but not elsewhere on the Down. It seems possible that this *Nomada* is a cleptoparasite of *A. nitidiuscula* in this site. This association has not previously been suspected. The nationally endangered *N. errans* Lepeletier is a known cleptoparasite of *A. nitidiuscula* in Britain (though the former is only known in this country from a single site on the Isle of Purbeck, Dorset). *N. rufipes* is considered to be a cleptoparasite of certain species in the *Andrena fuscipes* (Kirby) group, to which *A. nitidiuscula* does not belong. On heaths and moors it attacks *A. fuscipes* (Evans, 1906; Frisby, 1906), but elsewhere it seems to be associated with *A. denticulata* (Kirby) (Perkins, 1918, 1919; Chambers, 1949; Spooner, pers. comm.) and *A. nigriceps* (Kirby) (Swale, 1893; Jones, 1928; Chambers, 1949). None of these *Andrena* species has been recorded on Figheldean Down. However, *A. simillima* Smith, F., a close relative of *A. nigriceps*, does occur in this site in small numbers.

A. simillima Smith, F. This is another very scarce bee with a restricted range in Britain. It has mainly been found in east Kent (Folkestone Warren), south-east Devon and Cornwall. In addition there are old, unconfirmed records from the Isle of Wight, Suffolk and Norfolk (Else, in prep.). Inland sites are very unusual; the only ones known to us, prior to our survey, were in Dorset (Morden, 1928) and Hampshire (Abbotstone Down, near Alresford, 1985). The bee is mainly associated with flowers of Asteraceae, including thistles, knapweeds, scentless mayweed and common ragwort (*Senecio jacobaea* L.). S. P. M. R. found a male *A. simillima* on Figheldean Down on 11.vii.1993, followed by further single records of females on 14 and 22.vii. and 1.viii. Finally, G. R. E. found two females in the same site on 7.viii; one was visiting a flower of greater knapweed, the other scentless mayweed. Nationally, the bee flies as a single brood from early July to August.

Melitta dimidiata Mor. (Melittinae). This, the largest of the four British *Melitta* species, was first found in Britain near Tilshead by P. W. E. Currie on 9.vii.1949 (Baker, 1965). According to D. B. Baker (pers. comm.) the site was close to White Barrow, a neolithic long-barrow on Tilshead Down to the south of the village. Baker has also encountered the species on the barrow and, on numerous visits from 1964 to 1989, found the bee on the adjacent grassland and at Yarrow's site (see below). In the 1970s the custodians of White Barrow, The National Trust, attempted to control scrub invasion on the ancient monument by erecting a fence around it and introducing a flock of sheep. The sheep succeeded in eradicating both scrub and sainfoin, the latter being the sole pollen source of this bee!

On 10.vii.1965, I. H. H. Yarrow discovered the species in a second site on Salisbury Plain (Yarrow, 1968). Shortly before he emigrated to Australia in the 1980s, he disclosed to G. R. E. that the site was a neolithic barrow south-west of Tilshead (near Horse Down, north of the Chitterne road), not far from Currie's site.

In 1991 we rediscovered the bee near White Barrow on 16.vii, and on the following day at both Yarrow's site and West Down (east of and overlooking the army camp). In addition we also encountered it in two new sites: about a kilometre north of Tilshead and on the roadside about a kilometre east of West Down. It was particularly common at West Down, but only occurred in small numbers in the other sites visited. S. R. Miles (pers. comm.) found the bee at West Down in both July 1986 and July 1991.

In the following year we again found it on several dates in late June and July to the north of Tilshead and at West Down. Seven females and at least 36 males were seen by us on West Down on 27.vi, and both sexes plentifully on 28.vi by S. P. M. R. (from the roadside, south across the army range towards the main Tilshead to Shrewton road).

A further three sites for the species were found in 1993: Great Cheverell Hill (1.vii and on subsequent visits in the same month); Figheldean Down (in late June by D. Sheppard, and later by the authors on 11.vii and on a few visits thereafter). R. Gabriel encountered several males at a site 1 kilometre north-west of Tilshead on the West Lavington Road (east of Horse Down) on 16.vii.

The bee is protandrous, the males emerging ahead of the females. The former begin flying in late June and continue well into July. When freshly emerged, males are clothed over much of their bodies with rich, reddish brown hairs, but this colour rapidly fades to whitish, when specimens appear silvery on the wing.

Males fly rapidly between the sainfoin plants, only pausing occasionally for brief visits to the flowers. During cool, cloudy conditions this sex has been observed sheltering within the racemes of sainfoin and in the flowers of clustered bellflower (*Campanula glomerata* L.), field scabious and oxeye daisy. Females are generally active from late June to mid August (in 1993 an apparently freshly emerged specimen was found on 31.vii). In common with the other three species of British *Melitta*, they are not as frequently seen in the field as males. The females excavate their nesting burrows in the soil, but no nests of this bee have been found in Britain.

In Britain both sexes are known to forage only from the flowers of sainfoin. Thus *M. dimidiata* is entirely restricted to sites where there is sufficient sainfoin to maintain these populations. This plant is very widely distributed over the semi-natural grasslands of Salisbury Plain, with significant populations in many sites. Indeed, as a single unit, the Plain probably has the most extensive populations of this plant in the country.

Two forms of sainfoin occur in southern England, one native, the other introduced. The native one (ssp. *montana* Hegi) is characterized by deep pink flowers and fewer leaves, and is semi-procumbent to erect in form (Hegi, 1924; Dony 1953; Grose, 1957). There are late glacial British pollen records of sainfoin (Godwin, 1975), and it is presumed that *M. dimidiata* subsequently arrived in Britain in boreal or sub-boreal times (Baker, 1965). In addition, there are records of sainfoin in the writings of Gerarde (1597), Goodyer (c. 1634), Martyn (1792) and Britton (1801–25). Gerarde noted it in areas which today support strong populations of ssp. *montana*.

During the seventeenth century, another variant (ssp. *sativa* Hegi) was introduced as a fodder plant (Aubrey, 1685). This taxon differs from the native form in being taller, more erect, and the stems bearing paler flowers and more leaves, with broader leaflets, than its relative (Hegi, 1924). This introduction is now found as a relic

of former cultivation and it has been found in some localities on Salisbury Plain. It also seems to flower earlier in the season; for example, in late May 1990, it was in full flower in a site in east Dorset, yet the semi-procumbent form flowered about a month later on Salisbury Plain.

The difference in flowering periods of the two forms would largely restrict *M. dimidiata* to the native one. However, in sites where the grassland is mown for hay, plants of the introduced form of *O. viciifolia* flower again at a time when the bee can benefit from these additional flowers, although such a late flowering of this form is not as prolific as earlier in the season.

Apparent intermediates between the two strains (which appear in some localities on the Plain) are probably of hybrid stock. At least one farming family (Home Farm, near Cholderton, south of Bulford) has been growing the introduced variant as a seed and fodder crop for about a hundred years (A. Summers, pers. comm.) (sainfoin was mainly used as hay for horses, but the market for this has largely gone and very few farms currently grow the plant). Several commercial varieties of sainfoin have been developed for use on particular soil types.

Nomada argentata H.-S. (Anthophorinae). This is a rare but widely distributed species in southern England. It has been reported from Kent to east Cornwall, Somerset, Oxfordshire, Berkshire, Surrey, Bedfordshire and Cambridgeshire and has also been found in Eire (Carlow and Leix) (Else, in prep.). In Wiltshire it is currently known only from Figheldean Down, where it was found on 22.vii, 1 and 7.viii.1993. This species, in common with its host *Andrena marginata*, is extremely local in this site. Although a few specimens of the cleptoparasite were encountered visiting the flowers of small scabious, most (including both sexes) were observed flying low over the bare soil of tracks, the females presumably in search of the nests of *A. marginata*. Some *N. argentata* are very dark and can easily be passed over as small species of other aculeate genera. In the British Isles the species flies from mid July to mid September.

N. armata H.-S. This is a very rare cleptoparasite of the mining bee *Andrena hattorfiana*. Nationally, this *Nomada* species has been reported from Kent, the Isle of Wight, Dorset, Devon, Cornwall, Wiltshire, Oxfordshire, Surrey, Essex, Norfolk and West Glamorgan (Else, in prep.). It was first recorded in Wiltshire in July 1991 when we found a pair (male on 17th and female on the 21st) near Tilshead. We did not encounter it in 1992, but in the following year it was noted by us in the following sites: to the north of Tilshead, 27.vi. and on a few subsequent dates; Great Cheverell Hill, 1, 4 and 7.vii; Bulford, 4 and 7.vii; Figheldean Down, 15.vii; and Weather Hill, 20.vii. The Weather Hill specimen was visiting a flower of small scabious; all the others visiting flowers were at field scabious. A specimen was also seen on the east side of the West Lavington road (opposite Horse Down), 1 kilometre north-west of Tilshead, on 16.vii.1993 by R. Gabriel. A total of 35 individuals was encountered in 1993. The most recent British records are from east Dorset (1945 and 1949), Oxfordshire (1968) and Norfolk (1977). The majority of records refer to very small numbers of specimens. An exception was a record of many flying with their host *Andrena* at Tubney, near Oxford in July, 1900 (Hamm, 1901). Both host and parasite are usually encountered on the flowers of field scabious, less commonly on those of small scabious or unrelated plants. Some females, however, found by us, were flying low over occupied nesting burrows of the host *Andrena*. Salisbury Plain is undoubtedly the most important locality in Britain for *N. armata*. Nationally, the flight period extends from late June to the end of July.

Bombus ruderatus (F.) (Apinae). More than half the number (ten of seventeen) of native species of British bumblebees (excluding the six species of cuckoo

bumblebees—*Psithyrus* species) have been found on Salisbury Plain. Of these ten, *B. humilis* Ill., *B. lapidarius* (L.), *B. ruderarius* (Müller) and *B. sylvarum* (L.) are associated mainly with dry, calcareous grassland in southern England. An abraded queen of *B. ruderatus* was found just north of Tilshead on 27.vi.1992 by G. R. E. (the only specimen he has encountered anywhere in the past 24 years).

B. ruderatus was formerly a common and widely distributed species in Britain, the range extending from Kent to Cornwall, northwards to Northumberland (Else, in prep.); in Wales there is an old record from southern Gwynedd (see map in Anon., 1980). Sladen (1912) mentions that the species occurs in Scotland, and also cites a single Irish record. These old records cannot be confirmed and may be based on misidentifications. There can be no doubt that this bumblebee has declined dramatically this century. To Sladen it was a very common bee in England (his 'Large Garden Humble-bee'), but today it is rarely encountered, most other recent records originating from east Kent (P. Williams, pers. comm.) and East Anglia (S. Falk, pers. comm.). Even in these localities the species is very scarce. The British flight period of the species is from mid April to mid October.

B. sylvarum (L.). Although formerly widespread in southern Britain, the range of this bumblebee has diminished greatly in recent years. It has been recorded from Kent to Cornwall, northwards to Gwynedd, southern Cumbria and Northumberland (Anon., 1980). It is a rare and sporadic bee in Ireland, with only a single confirmed Scottish record. It occurs in various biotopes, but especially in chalk grassland. On Salisbury Plain it was found near White Barrow, in July 1983 and June 1984; and north of Tilshead in July 1991 and June 1992. R. Gabriel found the species on the east side of the West Lavington road (opposite Horse Down), 1 kilometre to the north-west of Tilshead, on 16.vii.1993. The national flight period is from mid May to September.

Psithyrus rupestris (F.). Formerly this cuckoo bumblebee was found throughout much of the British Isles, except for the far north of Scotland, the Scottish Islands and the Isle of Man (Else, in prep.). During this century the species' range has contracted dramatically, so that currently the bee is largely restricted to sites in southern England and Wales, and coastal Eire (Anon., 1980). Even in these areas the bee is very sporadic. The reason for the decline is unknown. The species is a social parasite of *Bombus lapidarius*, a bumblebee which remains common and widespread throughout much of the British Isles. In the past Sladen (1912) estimated that in east Kent females of *P. rupestris* usurped 20–40% of *B. lapidarius* nests. Nationally, this cuckoo bumblebee flies from late May to late September.

In recent years this species has been found in several sites on Salisbury Plain: Parsonage Down, near Winterbourne Stoke, a male, 17.vii.1982; Great Cheverell Hill, many females, 6 and 20.vi, one female 4.vii, and several males 21.viii.1993; Bulford, female, 6.vi.1993; near Tilshead, several females, 27.vi (unusually one had a bright yellow pronotal hair band) and 1.vii.1993, and a male 21.viii.1993.

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BOOK NOTICES

The encyclopedia of land invertebrate behaviour, by R. & K. Preston-Mafham, London, Blandford (Cassell), 1993, 320 pages, hardback, £30.—This very readable and entertaining book covers insects, spiders, molluscs and other land invertebrates. It is divided into chapters on sexual behaviour, egg-laying, parental care, feeding and defence. It is illustrated throughout with the excellent colour photographs for which the authors are renowned, together with numerous line drawings and diagrams. The whole gamut of behaviour is covered, with examples selected from species from around the world. An extensive bibliography is also given.

Caterpillars: ecological and evolutionary constraints on foraging, edited by N. E. Stamp and T. M. Casey, London, Chapman and Hall, 1993, xiv + 588 pages, hardback, £39.—Seventeen chapters by nineteen international contributors examine the ecology of caterpillars. Part 1 covers foraging: the effects of temperature, nutrition, circumventing plant defences, interactions between species, predators, parasitoids and body size. Part 2 looks at evolutionary consequences: crypsis, aposematic warnings, sociality and ant mutualism. Part 3 concludes with environmental variation: population dynamics, seasonality, climate and other factors affecting foraging.

Wood: decay, pests and protection, by R. A. Eaton and M. D. C. Hale, London, Chapman and Hall, 1993, x + 546 pages, hardback, £70.—A very detailed analysis of wood, its decay, its attackers, its preservation and its protection. Five of its 22 chapters consider insects attacking wood: the biology of wood-boring insects; taxonomy and worldwide distribution of pests; beetles; termites, and other wood-boring insects.

A directory for entomologists, by M. Colvin and D. Reavey, Amateur Entomologists' Society, 2nd revised edition, 1993, 62 pages, paperback, £2.40.—This is an extended and updated version of the 1989 edition. It contains names and addresses of all the national organizations that entomologists should need: national and local societies, special interest groups, recording schemes, field courses, grants, libraries, periodicals, museums, exhibitions, butterfly farms, trade fairs and entomological traders.

Dead wood matters: the ecology and conservation of saproxylic invertebrates in Britain, edited by K. J. Kirby and C. M. Drake, Proceedings of a British Ecological Society Meeting held at Dunham Massey Park on 24 April 1992, Peterborough, English Nature, 1993, 106 pages, comb-binding, £9.—Dead wood is one of the greatest resources for invertebrates in a forest and many of the rarest and most threatened species in Europe depend on it. The papers in this book deal with the history of Britain's dead wood fauna and how British sites compare with those on the Continent. Recent studies on both woodland and parkland dead wood habitats are presented.

Among papers on what saproxylic invertebrates are, fossil evidence, the European context, historic parklands and commercial forestry are articles on the liability of landowners having large old trees on their land, ideas on positive management for saproxylic invertebrates, a conservation guide for entomological investigation and an invertebrate conservation code for dealing with storm-damaged woodland.

DO TORTOISE BEETLE PUPAE MIMIC LACEWINGS?

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At first, this question may seem rather strange; how could the stout, wingless, wholly functional carapace of any coleopterous pupa resemble, in the slightest, the delicate winged and lithe form of the Neuroptera? The answer, as I hope the accompanying photographs show, is 'yes, when seen in profile'. I would argue that this is not just coincidental, not an accident of light, and not a trick played by a notorious trickster—the camera. However, it was the sight through the camera viewfinder that revealed this resemblance, a sight not usually seen by the field entomologist because the combination of focal length of the macro-lens and extension tubes produces an image on an insect-to-insect scale. Even armed with a hand lens, the perspective and depth of field of this image is not usually available to the human eye.

During its five larval instars, the tortoise beetle larva, in this case *Cassida viridis* L., carries about its previous larval skins, ornamented with its own droppings, in the form of a 'parasol' which it waves over its back to deter any would-be predator, or which camouflages the larva by resembling a bird dropping or other rubbish. The particular structure which allows the larva to do this is a long bifurcate prong called the caudal furca, caudal process, anal fork, or even 'feces fork' (Gressitt, 1952). By the time it pupates, the accumulated exuviae and frass may

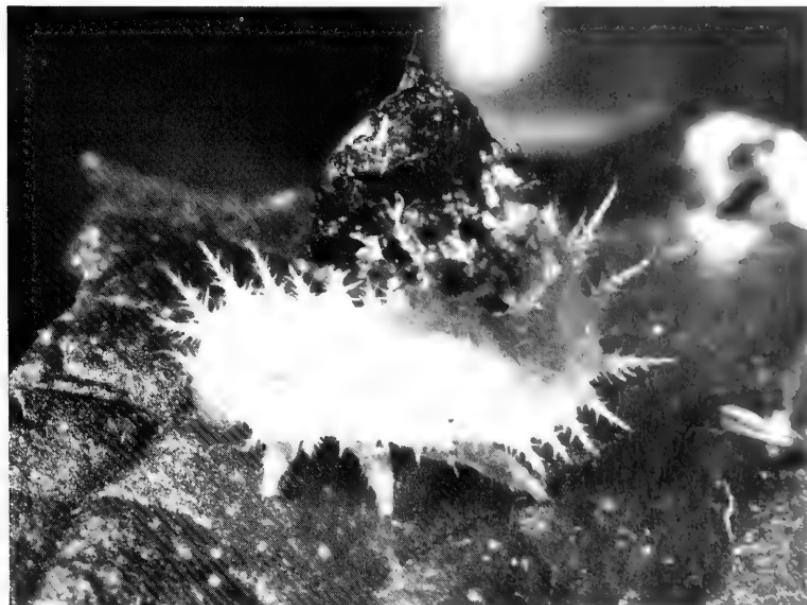


Fig. 1. The fifth instar larva of *Cassida viridis* waves its 'parasol' of accumulated shed skins and frass over its back while continuing to eat the mint leaf. Photo: R. A. Jones.

be almost as large as the larva itself (Fig. 1) and remains a deterrent and camouflage throughout the pupal stage.

The 'merdigerous' behaviour of tortoise beetle larvae is well known and well documented (Westwood, 1839; Sharp, 1909; Van Emden, 1962). But should the loose bundle of dried exuviae be disturbed from the pupa, only the first four instar skins become dislodged, leaving the fifth and final instar skin still firmly attached (Fig. 2). It is now that the profile of the pupa comes to resemble a lacewing (Figs 3 and 4).

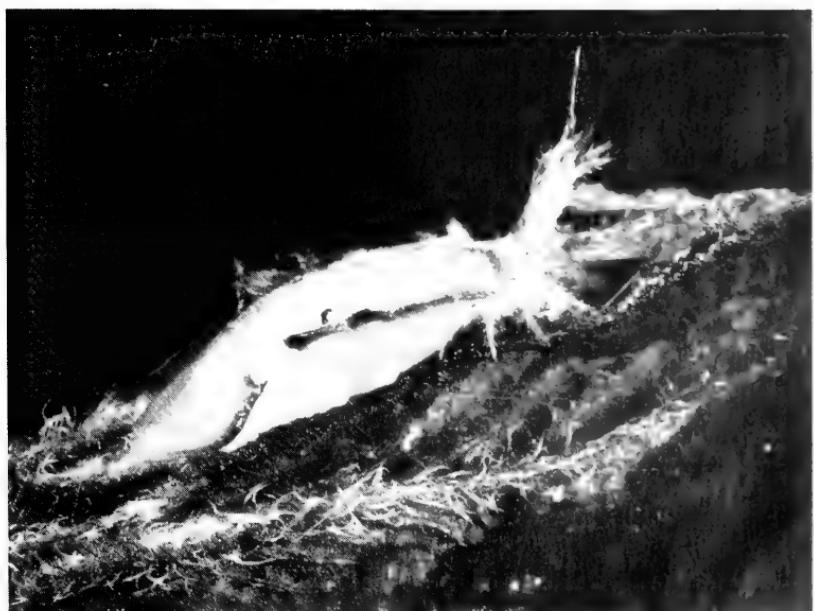
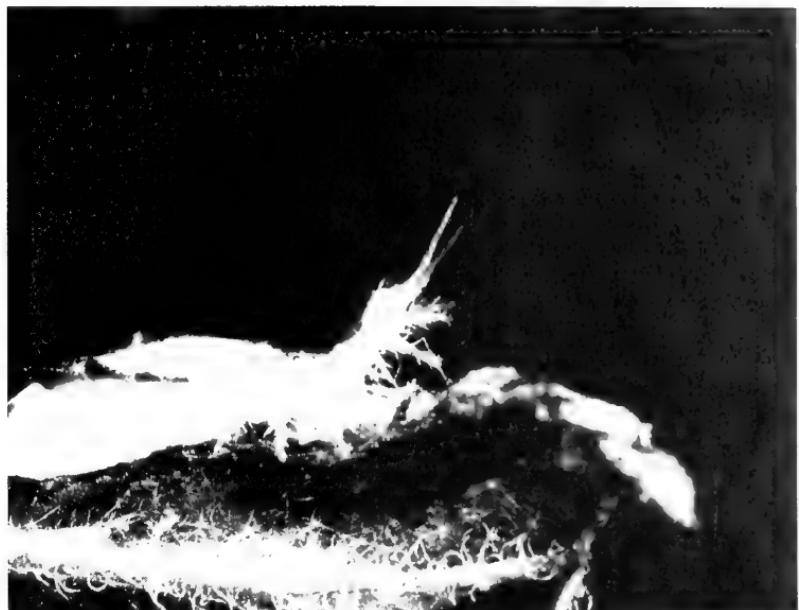
This resemblance is not fanciful, although it may be coincidental in that the pupa resembles a generalized insect form, with porrect 'head and thorax'. The caudal process comes to resemble two prominent antennae, the hind two lateral processes come to resemble large prognathous jaws while other lateral processes come to resemble legs.

This type of mimicry, where the relatively expendable tail-end of a creature distracts attack from the vulnerable head-end is common throughout the insect kingdom. The tails of 'tailed' butterflies, be they swallowtails, blues, skippers or hairstreaks, are supposed to resemble antennae and lure the attacks of birds away from the real antennae. Likewise, the eye spots of many butterflies resemble eyes, confounding a predator. The streaked markings at the wingtips of various microlepidoptera resemble eyes, legs and antennae when the moths are at rest, giving the impression of a reversed head/tail axis, e.g. *Ancylis badiana* (D. & S.), some *Glyptipteryx* species, and in particular many *Leucoptera* species. Some small leafhoppers (Hemiptera: Cicadellidae) have similar markings.

Thus, the resemblance of the *Cassida* pupa to a lacewing is not as comical as it might seem. It could be that an attacking predator is fooled into pecking or biting at the erect 'head', but instead of snatching up a tasty morsel, comes away with



Fig. 2. Dorsal view of the *Cassida* pupa, the caudal process and other remains of the fifth larval skin are clearly visible, although in this aspect not strikingly so. Photo: R. A. Jones.



Figs 3 and 4. Pupa of *Cassida viridis*, in side view. The resemblance to a lacewing now becomes apparent. The 'antennae' are the remnants of the caudal process, the 'jaws' the hind-most lateral processes and the 'legs' other lateral processes of the shrivelled larval skin. Photos: R. A. Jones.

a dry husk of dead skin. Should its first line of defence, subterfuge under what looks like bird manure, fail it, the pupa can hope for a second chance by offering its fifth cast skin as a decoy head and shoulders, and if this disguise is removed it must hope that its final flattened form, held tight onto the leaf, will conceal it until the adult beetle emerges, a few days later.

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BOOK REVIEW

Australian weevils, by E. C. Zimmerman. Melbourne, CSIRO, Volume 5, colour plates 1–304, 1991 and Volume 6, colour plates 305–632, 1992.—This ambitious series is envisaged to comprise 8 volumes, the remaining six (text) volumes to be published by 1996. Although perhaps only of peripheral interest to British entomologists, or to weevil specialists, the books are remarkable for their colour plate presentation of the insects themselves.

Each of the 632 colour plates is made up of 8 photographs arranged two by four down the page. Each pair of photographs shows dorsal and side view of a single specimen. A uniform blue background and careful lighting show the delicate colouring, sculpturing and scaling of each beetle to full advantage. Each specimen is mounted on a card point (occasionally one is pinned), allowing many underside characters to be seen in side view. The odd head or tail is shown in particular close-up and there are a few general shots of habits, but most of the plates are given over to this novel presentation. Books such as these represent landmark achievements; debate on whether photographs or paintings are superior hinge about them.

The various editions of South's *The moths of the British Isles* are accorded greater or lesser status depending on their colour plate style. With the appearance of Skinner's *Moths of the British Isles* photography looked set to take over from paintings, at least for the Lepidoptera. On the other hand set specimens of beetles are not so photogenic; the carabid volumes of the *Fauna Entomologica Scandinavica* series (Lindroth, C. H., 1985 and 1986) contained 8 colour plates from photographs and worked well enough for some of the prettily marked species.

At the BENHS's own annual exhibitions, highly interesting specimens are selected for photographic reproduction in the journal. Where butterflies and moths are regularly chosen, the occasional fly or bee makes an appearance, but beetles are seldom done justice, though not for want of interest on the part of the exhibit or technological expertise on the part of the photographer. At life size reproduction, beetles just do not photograph well. Here then is an example of how beetle photography can work—at between two and twenty times life size.

The lavish production of these two volumes could not have been possible without what must be some considerable financial input from the author and friends to subsidize the publishing costs. The author's faith in financing such a venture must surely be rewarded by the knowledge that the books are a remarkable achievement. The text volumes are awaited with interest.

THE MELIGETHES (COLEOPTERA: NITIDULIDAE) OF MONTGOMERYSHIRE (VICE-COUNTY 47)

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INTRODUCTION

The genus *Meligethes* Steph. has adults and larvae which develop in flowers, feeding on pollen as well as developing buds. Many of the species exhibit a high degree of species specificity in larval host-plants, although this is often less marked, notably in *M. aeneus* (F.) and *M. viridescens* (F.), which are both serious pests of cultivated oilseed rape and other yellow Brassicaceae. The genus is represented in Britain by thirty-four extant species (Kirk-Spriggs, in press), which utilize the botanical families Cistaceae, Rosaceae, Campanulaceae, Brassicaceae, Lamiaceae, Fabaceae and Boraginaceae as larval host-plants. Other flowering plants are often fed upon by adults before and after the flowering period of the larval host-plant (see Kirk-Spriggs, 1992), which explains why some species can be collected from a wide range of plants.

The genus is very poorly recorded in Wales. After an extensive search of the entomological literature I have only been able to trace one record from Montgomery: *M. aeneus* (F.), Lake Vyrnwy, [23/9821], (Ansorge, 1966: 70). The late Dr A. M. Easton made several trips to the vice-county during the 1960s and his detailed notebooks give full data on species and localities. I have included his unpublished records in this paper (indicated by his initials A. M. E.).

The nomenclature of the British species has changed considerably since the publication of the check-list of British Coleoptera (Kloet & Hincks, 1977); the names used here are according to Bacchus & Kirk-Spriggs (1991). I have also used the name *Meligethes persicus* Falderman, 1837, which is the new name for the species formerly known as *M. pedicularius* (Gyll., 1808) *nec auctt.* (Audisio, in press; Kirk-Spriggs, in press). The national conservation statuses given are those revised by Hyman & Parsons, in press.

I have made two collecting trips to the vice-county, in 1990 as part of the Coleoptera recording weekend organized by Roger Key (Joint Nature Conservation Committee, Peterborough), and in 1991 with Adrian Plant who was recording Empididae (Diptera).

The object of this paper is to give detailed records of the genus from this much under-collected county, in the hope that it will provide base-line data for future recorders, and perhaps help to spark interest in the group.

SPECIES AND LOCALITIES

Meligethes atratus (Olivier, 1790)

Very common, on *Rosa* spp. In Wales also occurring in Monmouth, Glamorgan, Brecon, Radnor, Cardigan, Merioneth, Caernarvon, Denbigh, Flint and Anglesey. Our largest British species.

Material examined: 1 Nelly Andrews Green, 33/2609, 3.ix.1961, *Centaurea nigra* L., (A. M. E.); 2 Long Mountain, 33/2808, 14.vi.1964, general sweeping, (A. M. E.); 2 Llanymynech Hill SSSI, TNR, 33/262216, 30.viii.1964, *Succisa pratensis* Moench, (A. M. E.); 1 male & 1 female Llanymynech Hill SSSI, TNR, 33/262216, 9.vi.1990, *Rosa* sp., (A. H. K.-S.); 1 male & 1 female same data *in copula*.

(A. H. K.-S.); 1 male Llyn Mawr SSSI, TNR, 32/0097, 10.vi.1991, *Crataegus monogyna* Jacq., (A. H. K.-S.); 1 Mochdre Dingles SSSI, 32/080878, 2.vi.1991, *Crataegus monogyna* Jacq., (A. H. K.-S.); 3 Pen-dugwm Woods SSSI, TNR, 33/107140, 31.v.1991, *Sorbus aucuparia* L., (A. H. K.-S.); 8 same data, *Crataegus monogyna* Jacq., (A. H. K.-S.); 2 near Gwernafon, 22/923906, 30.v.1991, *Anthriscus sylvestris* (L.) Hoffm., (A. H. K.-S.).

Meligethes flavimanus Stephens, 1830

Occurring broadly over much of England, on *Rosa* spp. In Wales also occurring in Monmouth, Glamorgan, Brecon, Cardigan, Merioneth, Caernarvon and Flint.

Material examined: 2 Crew Green, 33/3215, 14.vi.1964, *Rosa* sp., (A. M. E.); 1 Aber Bechan, 32/1493, 12.vii.1964, sweeping along canal side, (A. M. E.); 6 males & 1 female Llanymynech Hill SSSI, TNR, 33/262216, 9.vi.1990, *Rosa* sp., (A. H. K.-S.); 1 male Moel y Golfa SSSI, 33/290122, 1.vi.1991, *Crataegus monogyna* Jacq., (A. H. K.-S.); 1 Caerhowel camp site, 32/203979, 2.vi.1991, *Crataegus monogyna* Jacq., (A. H. K.-S.); 1 Pen-dugwm Woods SSSI, TNR, 33/107140, 31.v.1991, *Crataegus monogyna* Jacq., (A. H. K.-S.).

Meligethes viridescens (Fabricius, 1787)

On yellow Brassicaceae. Common and widely distributed, over the whole of England and Wales and much of Scotland.

Material examined: 1 Trinity Well, 33/267078, 3.ix.1961, *Centaurea nigra* L., (A. M. E.); 1 Nelly Andrews Green, 33/2609, 3.ix.1961, *Centaurea nigra* L., (A. M. E.); 2 Long Mountain, 33/2808, 14.vi.1964, *Viburnum opulus* L., (A. M. E.); 1 Aber Bechan, 32/1493, 12.vii.1964, *Heracleum sphondylium* L., (A. M. E.); 2 Cwm fron, near Llanidloes, 22/972813, 20.ix.1964, *Brassica* sp., (A. M. E.).

Meligethes aeneus (Fabricius, 1775)

On yellow Brassicaceae. Common and widely distributed, over the whole of England and Wales and much of Scotland.

Material examined: 7 Breidden Hill SSSI, 33/294145, 5.vi.1960, *Ranunculus repens* L., (A. M. E.); 1 Trinity Well, 33/267078, 3.ix.1961, *Centaurea nigra* L., (A. M. E.); 1 Frochas, 33/295102, 1.v.1964, *Ranunculus ficaria* L., (A. M. E.); 1 same data, *Anemone nemorosa* L., (A. M. E.); 1 same data, *Oxalis acetosella* L., (A. M. E.); 4 Frochas, 33/295102, 30.iv.1967, *Ranunculus ficaria* L., (A. M. E.); 1 same data, *Taraxacum officinale* agg., (A. M. E.); 9 Llanymynech Hill SSSI, TNR, 33/262216, 31.v.1964, *Crataegus monogyna* Jacq., (A. M. E.); 2 Crew Green, 33/3215, 14.vi.1964, *Rosa* sp., (A. M. E.); 1 Llandrinio, 33/2917, 14.vi.1964, *Ballota nigra* L., (A. M. E.); 34 Llandrinio, 33/2917, 12.vii.1964, *Ballota nigra* L., (A. M. E.); 1 Four Crosses, 33/2718, 14.vi.1964, *Aegopodium podagraria* L., (A. M. E.); 2 Long Mountain, 33/2808, 14.vi.1964, general sweeping, (A. M. E.); 1 same data, *Viburnum opulus* L., (A. M. E.); 1 Corndon Hill SSSI, 32/309966, 14.vi.1964, general sweeping at foot of hill, (A. M. E.); 1 Aber Bechan, 32/1493, 12.vii.1964, *Heracleum sphondylium* L., (A. M. E.); 27 same data, sweeping along canal side, (A. M. E.); 5 Cwm fron, near Llanidloes, 22/972813, 20.ix.1964, *Brassica* sp., (A. M. E.); 1 Llyn Mawr SSSI, TNR, 32/0097, 10.vi.1991, *Taraxacum officinale* agg., (A. H. K.-S.); 16 same data, *Crataegus monogyna* Jacq., (A. H. K.-S.); 1 edge of Montgomery Canal, near Welshpool, 33/2206, 9.vi.1990, *Stachys sylvatica* L., (A. H. K.-S.); 5 same data, *Taraxacum officinale* agg., (A. H. K.-S.); 6 Newtown railway station, 32/1191,

10.vi.1990, *Sisymbrium officinale* (L.) Scop., (A. H. K.-S.); 1 same data, *Rosa* sp., (A. H. K.-S.); 1 Moel y Golfa SSSI, 33/290122, 1.vi.1991, pre-flowering *Teucrium scorodonia* L., (A. H. K.-S.); 2 same data, *Alliaria petiolata* (Bieb.) Cav. & Gra., (A. H. K.-S.); 1 Llanmerewig Glebe TNR, 32/160929, 2.vi.1991, *Anthriscus sylvestris* (L.) Hoffm., (A. H. K.-S.); 1 same data, *Crataegus monogyna* Jacq., (A. H. K.-S.); 1 Mochdre Dingles SSSI, 32/080878, 2.vi.1991, *Anthriscus sylvestris* (L.) Hoffm., (A. H. K.-S.); 10 Breidden Hill SSSI, 33/294145, 31.v.1991, *Hyacinthoides non-scripta* (L.) Chouard ex Rothm., (A. H. K.-S.); 133 same data, *Barbarea vulgaris* R. Br., (A. H. K.-S.); 3 Pen-dugwm Woods SSSI, TNR, 33/107140, 31.v.1991, *Crataegus monogyna* Jacq., (A. H. K.-S.); 1 Coedydd Llawr-y-Glyn SSSI, Gwernafon, 22/924906, 30.v.1991, *Ranunculus ficaria* L., (A. H. K.-S.); 1 Corndon Hill SSSI, 32/309966, 1.vi.1991, *Taraxacum officinale* agg., (A. H. K.-S.).

Meligethes atramentarius Förster, 1849 (Notable)

A local species on *Lamiastrum galeobdolon* (L.) Ehrend. & Polatschek. In Wales also occurring in Monmouth, Glamorgan, Brecon, Radnor, Carmarthen and Flint.

Material examined: 1 female Frochas, 33/295102, 1.v.1964, *Anemone nemorosa* L., (A. M. E.); 2 male Pen-dugwm Woods SSSI, TNR, 33/107140, 31.v.1991, *Lamiastrum galeobdolon* (L.) Ehrend. & Polatschek, (A. H. K.-S.).

Meligethes brunnicornis Sturm, 1845

A common species on *Stachys sylvatica* L. In Wales also occurring in Monmouth, Glamorgan, Brecon, Radnor, Pembroke, Cardigan, Caernarvon and Flint.

Material examined: 1 Breidden Hill SSSI, 33/294145, 5.vi.1960, *Geum urbanum* L., (A. M. E.); 1 male Frochas, 33/295102, 31.v.1964, *Lamiastrum galeobdolon* (L.) Ehrend. & Polatschek, (A. M. E.); 2 males & 1 female Llanymynech Hill SSSI, TNR, 33/262216, 9.vi.1990, *Stachys sylvatica* L., (A. H. K.-S.); 5 males & 1 female Pen-dugwm Woods SSSI, TNR, 33/107140, 31.v.1991, *Lamiastrum galeobdolon* (L.) Ehrend. & Polatschek, (A. H. K.-S.).

Meligethes kunzei Erichson, 1845

A locally common species, on *Lamiastrum galeobdolon* (L.) Ehrend. & Polatschek. In Wales also occurring in Monmouth, Glamorgan, Brecon, Radnor, Carmarthen, Denbigh and Flint.

Material examined: 1 male & 2 females Frochas, 33/295102, 30.iv.1967, *Lamiastrum galeobdolon* (L.) Ehrend. & Polatschek, (A. M. E.).

Meligethes difficilis (Heer, 1841)

A very common species on *Lamium album* L. In Wales also occurring in Monmouth, Glamorgan, Brecon, Radnor, Carmarthen, Denbigh and Flint.

Material examined: 1 Garth-derwen, 33/263097, 3.ix.1961, *Lamium album* L., (A. M. E.); edge of Montgomery Canal, near Welshpool, 33/2206, 9.vi.1990, *Lamium album* L., (A. H. K.-S.); 1 male & 2 females Caerhowel camp site, near Montgomery, 32/203979, 1.vi.1991, *Lamium album* L., (A. H. K.-S.).

Meligethes pedicularius (Gyllenhal, 1808) nec auctt. (= *M. viduatus* (Heer, 1841))

A local species, on *Galeopsis tetrahit* L. *sensu lato*. In Wales also occurring in Brecon, Cardigan, Merioneth and Caernarvon.

Material examined: 2 females Cwm fron, near Llanidloes, 22/972813, 20.ix.1964, *Galeopsis tetrahit* L. *sensu lato*, (A. M. E.).

Meligethes morosus Erichson, 1845

A common and widely distributed species on *Lamium album* L. In Wales also occurring in Monmouth, Glamorgan, Brecon, Radnor, Carmarthen, Denbigh and Flint.

Material examined: 5 Garth-derwen, 33/263097, 3.ix.1961, *Lamium album* L., (A. M. E.); 6 Four Crosses, 33/2718, 31.v.1964, *Lamium album* L., (A. M. E.); 1 female Llanymynech Hill SSSI, TNR, 33/262216, 9.vi.1990, *Thymus polytrichus* A. Kerner ex Borbas, (A. H. K.-S.); 3 males edge of Montgomery Canal, near Welshpool, 33/2206, 9.vi.1990, *Lamium album* L., (A. H. K.-S.); 1 male Llanmerewig Glebe TNR, 32/160929, 2.vi.1991, *Lamium album* L., (A. H. K.-S.); 3 males & 2 females Caerhowel camp site, near Montgomery, 32/203979, 1.vi.1991, *Lamium album* L., (A. H. K.-S.).

Meligethes persicus Faldermann, 1837 (= *M. pedicularius* (Gyll.) auctt.)

A common and widely distributed species on *Stachys officinalis* (L.) Trev. St Leon. In Wales also occurring in Monmouth, Glamorgan, Brecon, Radnor, Carmarthen, Pembroke, Cardigan, Denbigh and Flint.

Material examined: 1 male & 2 females Old Church Stoke, 32/2894, 12.vii.1964, *Stachys officinalis* (L.) Trev. St Leon, (A. M. E.).

Meligethes nigrescens Stephens, 1830

A common and widely distributed species on *Trifolium repens* L. In Wales also occurring in Monmouth, Glamorgan, Brecon, Radnor, Carmarthen, Pembroke, Cardigan, Caernarvon, Denbigh and Anglesey.

Material examined: 1 Trinity Well, 33/267078, 3.ix.1961, *Centaurea nigra* L., (A. M. E.); 1 Four Crosses, 33/2718, 14.vi.1964, *Aegopodium podagraria* L., (A. M. E.); 1 male & 1 female Breidden Hill SSSI, 33/294145, 31.v.1991, *Hyacinthoides non-scripta* (L.) Chouard ex Rothm., (A. H. K.-S.).

Meligethes obscurus Erichson, 1845

A common and widely distributed species on *Teucrium scorodonia* L. In Wales also occurring in Monmouth, Glamorgan, Brecon, Radnor, Carmarthen, Pembroke, Cardigan, Merioneth, Caernarvon, Denbigh, Flint and Anglesey.

Material examined: 1 Breidden Hill SSSI, 33/294145, 5.vi.1960, *Ranunculus repens* L., (A. M. E.); 2 same data, *Teucrium scorodonia* L., (A. M. E.); 4 same data, *Veronica chamaedrys* L., (A. M. E.); 4 same data, *Fragaria vesca* L., (A. M. E.); 7 same data, *Hieracium* sp., and *Senecio aquaticus* Hill, (A. M. E.); 6 same data, *Geum urbanum* L., (A. M. E.); 2 same data, *Hieracium* agg., (A. M. E.); 57 same data, *Ajuga reptans* L., also on almost every flower seen, including *Viola* sp. & *Digitalis purpurea* L., (A. M. E.); 1 same data, *Lotus corniculatus* L., (A. M. E.); 4 Breidden Hill SSSI, 33/294145, 3.ix.1961, *Hieracium* agg., (A. M. E.); 4 same data, *Solidago virgaurea* L., (A. M. E.); 1 same data, *Centaurea nigra* L., (A. M. E.); 1 Trinity Well, 33/267078, 3.ix.1961, *Leontodon autumnalis* L., (A. M. E.); 2 Long Mountain, 33/2808, 14.vi.1964, general sweeping, (A. M. E.); 1 male & 1 female Todleth Hill, 32/2894, 12.vii.1964, *Clinopodium vulgare* L., (A. M. E.); 1 female Long Mountain, 33/2808, 12.vii.1964, *Clinopodium vulgare* L., (A. M. E.); 1 male & 1 female

Isygarreg, 22/736987, 20.ix.1964, *Leontodon hispidus* L., (A. M. E.); 1 male & 2 females Isygarreg, 22/736987 plus 22/708984, 20.ix.1964, *Jasione montana* L., (A. M. E.); 1 male Llanymynech Hill SSSI, TNR, 33/262216, 9.vi.1990, *Helianthemum nummularium* (L.) Miller, (A. H. K.-S.); 4 males & 5 females same data, *Thymus polytrichus* A. Kerner ex Borbas, (A. H. K.-S.); 1 female Moel y Golfa SSSI, 33/290122, 1.vi.1991, *Teucrium scorodonia* L., (A. H. K.-S.); 1 female Breidden Hill SSSI, 33/294145, 31.v.1991, *Lotus corniculatus* L., (A. H. K.-S.); 1 female same data, *Lepidium campestre* (L.) R. Br., (A. H. K.-S.); 1 female same data, *Fragaria vesca* L., (A. H. K.-S.); 3 males same data, *Hyacinthoides non-scripta* (L.) Chouard ex Rothm., (A. H. K.-S.); 7 males & 2 females same data, *Alliaria petiolata* (Bieb.) Cav. & Gra., (A. H. K.-S.); 3 males & 2 females same data, *Hieracium* agg., (A. H. K.-S.); 18 males & 19 females same data, *Polygala vulgaris* L., (A. H. K.-S.); 1 male Coedydd Llawr-y-Glyn SSSI, Esgairleth, 22/918905, 30.v.1991, *Potentilla* sp., (A. H. K.-S.).

Meligethes carinulatus Förster, 1849 (= *M. erythropus* (Marsham) auctt. partim.)

A common and widely distributed species on *Lotus corniculatus* L. In Wales also occurring in Monmouth, Glamorgan, Brecon, Radnor, Carmarthen, Pembroke, Cardigan, Merioneth, Caernarvon, Denbigh, Flint and Anglesey.

Material examined: 2 Breidden Hill SSSI, 33/294145, 5.vi.1960, *Lotus corniculatus* L., (A. M. E.); 1 male Frochas, 33/295102, 30.iv.1967, *Taraxacum officinale* agg., (A. M. E.); 3 males & 6 females Llanymynech Hill SSSI, TNR, 33/262216, 9.vi.1990, *Lotus corniculatus* L., (A. H. K.-S.); 2 males & 1 female Llanmerewig Glebe TNR, 32/160929, 2.vi.1991, *Lotus corniculatus* L., (A. H. K.-S.); 1 male Llyn Mawr SSSI, TNR, 32/0097, 10.vi.1991, *Lotus corniculatus* L., (A. H. K.-S.); 3 males Mochdre Dingles SSSI, 32/080878, 2.vi.1991, *Lotus corniculatus* L., (A. H. K.-S.); 1 male Breidden Hill SSSI, 33/294145, 31.v.1991, *Barbarea vulgaris* R. Br., (A. H. K.-S.); 3 males & 1 female Pen-dugwm Woods SSSI, 33/107140, 31.v.1991, *Lotus corniculatus* L., (A. H. K.-S.); 4 males Corndon Hill SSSI, 32/309966, 1.vi.1991, *Taraxacum officinale* agg., (A. H. K.-S.).

Meligethes exilis Sturm, 1845 (Notable)

A local species, on *Thymus polytrichus* A. Kerner ex Borbas (= *T. praecox* Opiz subsp. (*arcticus* E. Durand) & Jalas). In Wales also occurring in Glamorgan, Carmarthen, Pembroke, Cardigan, Merioneth, Caernarvon, Denbigh, Flint and Anglesey.

Material examined: 2 females Llanymynech Hill SSSI, TNR, 33/262216, 31.v.1964, *Thymus polytrichus* A. Kerner ex Borbas, (A. M. E.); 1 female Llanymynech Hill SSSI, TNR, 33/262216, 30.viii.1964, *Knautia arvensis* (L.) Coulter, (A. M. E.); 12 males & 10 females Llanymynech Hill SSSI, TNR, 33/262216, 9.vi.1990, *Thymus polytrichus* A. Kerner ex Borbas, (A. H. K.-S.).

Meligethes ovatus Sturm, 1845

A fairly common species, on *Glechoma hederacea* L. In Wales also occurring in Monmouth, Glamorgan, Brecon, Radnor, Carmarthen, Pembroke, Cardigan, Merioneth, Caernarvon, Denbigh, Flint and Anglesey.

Material examined: 4 females Winllan Hill, 33/216212, 19.iv.1964, *Glechoma hederacea* L., (A. M. E.).

ACKNOWLEDGEMENTS

The use of unpublished data included in this paper was due to the great kindness of the late Dr A. M. Easton, who passed his notes and records to me before his death. Mr David Boyce (Countryside Council for Wales), was very helpful in organizing permission to visit SSSIs, and also helped with the collection of specimens at some of the sites. I am very grateful to Mr Gerry Longley (Montgomeryshire Wildlife Trust) and Mr Jerry Longford (The Woodland Trust) who both very kindly gave permission to collect specimens on their reserves. Botanical names were checked by Dr George Hutchinson (Botany Department, National Museum of Wales).

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BOOK REVIEW

Insects on cabbages and oilseed rape, by William D. J. Kirk, *Naturalists' Handbooks* 18, Richmond Publishing, Slough, 1992, 66pp, £7.95 paperback, £13 hardback.—Like other books in its series, this one selects a field that can be presented in reasonable detail within a small space. Thus, the author has managed to provide some very interesting background information on brassicas and their special role as insect foodplants, while also outlining the biology of many of the principal foliage and flower-feeding insects. No such work would be complete without a guide to identification, and this is duly supplied in the form of illustrated keys to all the common brassica-inhabiting insects, together with monochrome and colour plates depicting those most likely to be encountered by farmers and gardeners. There is also a short guide to collecting and other techniques.

One of the nice things about this sort of subject is that it can be studied on one's own doorstep, and this book should therefore help many people whose curiosity about local creepy-crawlies is not matched by a comprehensive knowledge of the many taxonomic groups to which they belong. It also highlights the scope for research, some areas of which could readily be tackled by the amateur. Thus, there is plenty here for entomologists of all persuasions, as well as students, farmers and gardeners.

**SILENE ACAULIS (L.) JACQ. (CARYOPHYLLACEAE),
THE LARVAL FOODPLANT OF DELIA PILIVENTRIS
(POK.) (DIPTERA: ANTHOMYIIDAE)**

K. P. BLAND

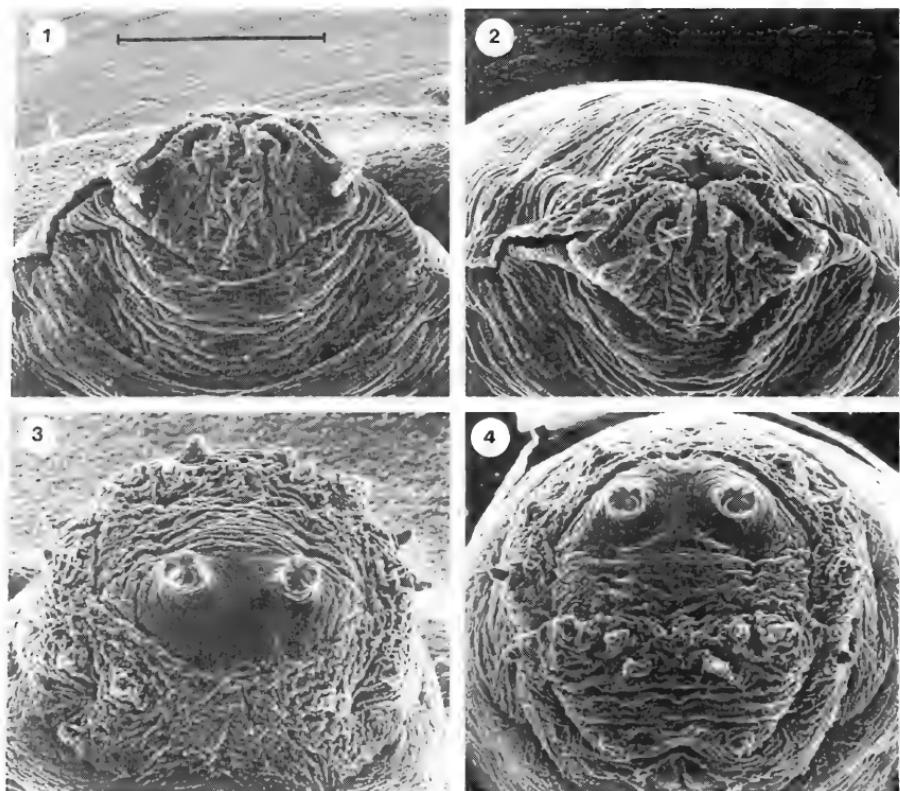
35 Charterhall Road, Edinburgh EH9 3HS.

The first British records of *Delia piliventris* (Pokorny, 1889) appear to be those of Collin (1933). Under the name of '*Delia fasciventris* Ringdahl M. S.', Collin reports that '3 males and a possible female were taken by Dr Edwards at 2000 to 3000 feet [i.e. 600–900 m] elevation in different localities in the Killin district (Perthshire)'. This species has since been found very locally in several widely scattered montane localities in western Scotland (Horsfield, 1984, 1988; D. Horsfield, pers. comm.). Abroad the species has a circumpolar distribution; its headquarters is Scandinavia but it extends via the Faroes to much of the arctic part of North America. It is also well distributed in the Alps (Hennig, 1974). In spite of its widespread distribution abroad, its larval habits do not appear to have been recorded.

In July 1984 while collecting at 840 m on the south slopes of Sanna, in Kilpisjarvi, Finland, I came across some dipterous larvae boring down the shoots of moss campion, *Silene acaulis* (L.) Jacq. Although one of the larvae eventually pupated, it failed to develop any further.

On 2.viii.1992 similar dipterous larvae were found at 500 m on the crags in Corrie Fee (O. S. grid ref. NO2474), Glen Doll, Angus (vice-county 90). Again they were boring down the centre of the shoots of *Silene acaulis*. Each larva bored down the centre of a shoot eating out the mesophyll from each leaf in turn until nearly all the green leaves had been reduced to empty brown sheaths. It then emerged from the shoot, crawled over the surface of the leaf cushion and bored down another shoot often a centimetre or more away. Several shoots were consumed in this way before the larva descended to the base of the cushion to pupate in the damp substrate. If the larva fell through the cushion while moving from one shoot to another—a difficult action in the wild but easily engineered in a rearing tube—it seemed unable to find its way back up onto the cushion of growing shoots. This phenomenon indicates that the larva is very dependent on the physical structure of its foodplant for its survival and so may be restricted to *Silene acaulis*. This possible specificity to moss campion is further supported by the close similarity of the known distributions of the fly and of *S. acaulis* (Jones & Richards, 1962). Towards the end of August a single larva burrowed into the damp tissues beneath the foodplant, successfully pupated and became quiescent for the winter. In early May the puparium started to show imaginal development within but the male imago died fully formed within the puparium at the beginning of June. Dissection of the genitalia indicated the fly to be *Delia fasciventris* Ringdahl, 1933 (based on illustrations in Ringdahl, 1959) or *Delia piliventris* (Pokorny, 1889) (based on illustrations in Hennig, 1974). Hennig (1974) gives *fasciventris* as a junior synonym of *piliventris*.

On 16.viii.1992 at 600 m on Meall nan Tarmachan (O. S. grid ref. NN5940), near Killin, Perthshire (vice-county 88) further dipterous larval signs were found on *Silene acaulis*. Most of the larvae had abandoned the plants but a single larva was procured. This larva pupated on 29.viii.1992. Again the larva burrowed down some 1 cm into the damp substrate beneath the *Silene acaulis* before pupating. On 23.vi.1993 this puparium produced a female *Delia piliventris*. It is probable that this site is one of Dr Edwards's original localities.



Figs 1-4. Details of the puparium of *Delia piliventris*. Figs 1 & 2. Dorsal and frontal views of anterior end of puparium. Figs 3 & 4. Dorsal and anal views of posterior end of puparium. Scale bar 0.5 mm.

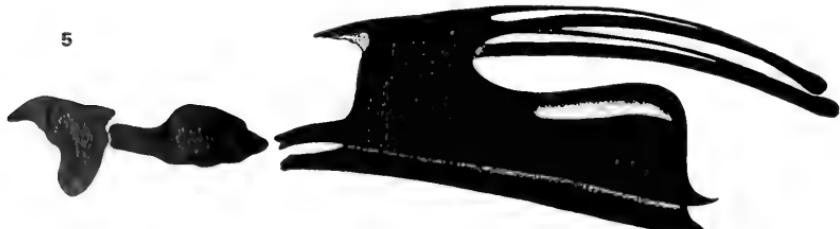


Figure 5. Reconstructed larval mouthparts of final instar larva of *Delia piliventris*.

Comparison of the unemerged puparium from Kilpisjarvi, Finland with that from Corrie Fee showed no appreciable differences between them, suggesting them to be the same species. Details of the puparium and larval mouth-parts of the male specimen from Corrie Fee are shown in Figs 1-5.

ACKNOWLEDGEMENTS

I am grateful to Mike Nelson for invaluable assistance with identification and loan of materials, to Graham Rotheray for nursing the Beinn Lawers female through its final critical stages of development, to Derek Penman for assistance with the scanning electron microscopy and to Colin Warwick for preparation of the photographs. I also acknowledge the cooperation of the Royal Museum of Scotland, Edinburgh in allowing use of the Scottish insect records index.

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LETTER TO THE EDITOR

Recent Lepidoptera papers in the journal. I was absolutely delighted to discover on receipt of the latest issue (*Br. J. Ent. Nat. Hist.* 1993, **6(4)**), two papers on British Lepidoptera. These papers, The British Epermeniidae and The British species of *Caryocolum* are of a similar style and format to their predecessors. Since I cannot recall noting any published responses relative to this 'series' I would like to take the opportunity to state that I find such papers extremely valuable as a data source. The Society performs a valuable service to its members in publishing papers of this type. Although my interests are heavily biased towards the Lepidoptera, and thus I am not entirely in a position to comment, I can well imagine that similar papers on the other orders are equally valuable. Whilst fully appreciating the amount of time and effort which has to be invested in compiling these accounts I hope we may look forward to further contributions. In addition, in the plates of the latest publication I think the inclusion of specimens from yesteryear is most welcome. I would like to think that if messers Banks and Ford are looking down on us now they would be delighted that full use is still being made of their collections.

However, I do have one query. Whilst perusing the accounts of the various species I noted under *Caryocolum blandulella* that the larva has been found in Britain and in Sweden. But no dates are quoted! I referred to such literature as was within reach from the comfort of my armchair and noted that there was a vacancy for this particular piece of information in all the volumes which were at hand. Information upon this small point would be most welcome as dates are quite often the base from which searches for various species are conducted.—M. H. Smith, 42 Bellefield Crescent, Trowbridge, Wiltshire.

BENHS ANNOUNCEMENTS

Assistant Treasurership.—Our Assistant Treasurer, Geoff Burton, is stepping down after serving the Society in this capacity for more than ten years and we are seeking a replacement as soon as possible.

The duties of the Assistant Treasurer are, *inter alia*, to keep the membership list up to date on the Society's computer, which is kept at his house, recording changes in membership and keeping the Distribution Secretary, the Sales Secretary and other Council Members informed. He is responsible for producing address labels from the computer to assist the Distribution Secretary. He is responsible for receiving and recording all subscriptions paid and sending reminder letters to those who do not pay on time or who underpay and taking any other necessary actions, which may include directing that distributions be withheld from defaulters or advising Council that they be removed from Membership.

The Assistant Treasurer may be co-opted to Council but it will not normally be necessary for him to attend more than one or two meetings a year. He will normally be recruited from the Ordinary Membership and will be interested in communicating and want to put back something into the Society.

The busiest times of the year are around December and January when the majority of subscriptions are received and have to be checked off against the bank statements, early Spring when reminder letters are sent and at the Annual Exhibition when many subscriptions are paid. However, the Assistant Treasurer has to be prepared to do something every week as there are address changes to note, late subscriptions and queries to attend to and information to impart to and receive from other Council Members.

The routines in use have largely been developed by Geoff Burton and it will be necessary to collect the computer and be briefed on the procedures, all assistance will be given in this. It is not necessary to have prior knowledge of computers.

If you feel you can help the Society please contact the Treasurer initially for more details.—A. J. Pickles, Treasurer, 2a Park Avenue, Lymington, Hampshire SO41 9GX. Tel: 0590-675 366.

The Society's Council.—The Council of the BENHS comprises the officers of the Society, several assistant secretaries to organize meetings, sales, exhibitions and mailings, and 'ordinary' members. All combine to run the Society and carry out its objectives.

A new Council is elected each year, but although many names remain the same, new Council members are constantly sought. There are always additional tasks for Council members to undertake, but these need not be at all arduous. For new Council members, the only 'task' set them is to attend as many of the monthly Council meetings as they are able and to contribute their opinions and knowledge to the discussions.

If you would like to get more involved in the running or organization of the Society, Council would be pleased to hear from you. A list of current officers and other Council members appears inside the back cover of this issue of the journal; these and others are also listed on the Society's current meetings card. Alternatively, please telephone the Editor, Richard A. Jones, 13 Bellwood Road, Nunhead, London SE15 3DE. Tel: 071-732-2440.

LYCIELLA STYLATA PAPP AND *L. SUBPALLIDIVENTRIS* PAPP (DIPTERA: LAUXANIIDAE) NEW TO BRITAIN

ANDREW GODFREY

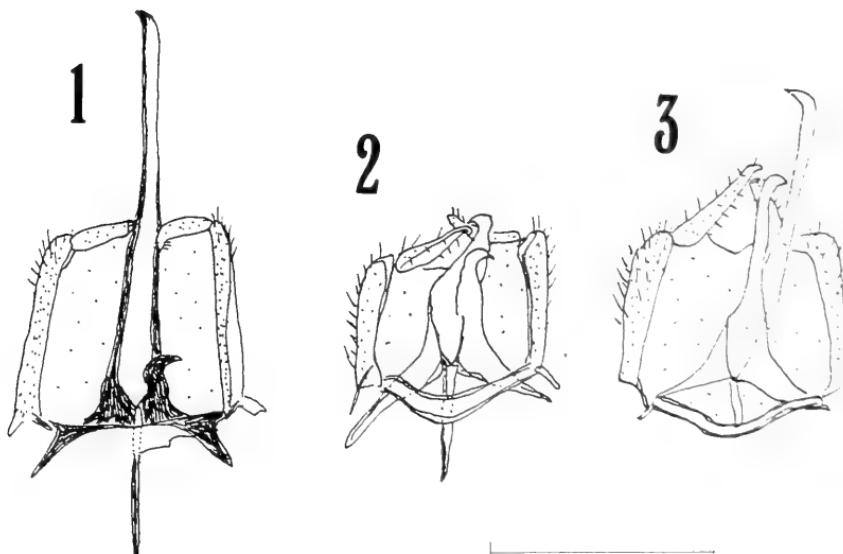
Ecosurveys Ltd, Priory Lodge, Hagnaby, Spilsby, Lincolnshire PE23 4BP.

Whilst sorting and identifying Diptera in the collections at Cliffe Castle Museum, Keighley, West Yorkshire, four specimens which key out in Collin (1948) as *Lyciella pallidiventris* (Fallén, 1820) were identified. Papp (1979a) describes two species of *Lyciella* very similar to *L. pallidiventris*. On checking the specimens with this paper I found that they agreed with the description and figures of *L. stylata*. Subsequent checking of specimens from other collections revealed the presence of the second Papp species, *L. subpallidiventris*. Specimens of the newly recognized British species were exhibited at the 1991 BENHS annual exhibition and published in the Exhibition Report (Godfrey, 1992). Full details of these species are provided here.

Lyciella stylata Papp, 1979

Very similar to *L. pallidiventris*. Only separable on the male genitalia. The left gonite is very long and slightly bent at the tip whilst the right gonite is extremely short and hook-like (Fig. 1). These structures are visible without dissection; the long left gonite being particularly noticeable. Further illustrations are given by Papp (1979a).

L. stylata is known from Hungary, Romania, Czechoslovakia, former Yugoslavia, Austria, Latvia and Estonia. I have also taken two males from Loupiac, near Soilliac, France on 7.vii.1993. British records available to me are as follows (all records refer to single males unless otherwise stated).



Figs 1–3. Male gonites, ventral view. 1: *Lyciella stylata*. 2: *L. subpallidiventris*. 3: *L. pallidiventris*.
Scale bar 1 mm.

England. Bucks.: Chenies 17.viii.1893 (AP); at flowers of Japanese knotweed, Burnham Beeches SU98, 15.ix.1970 (PJC). Cambs.: one on Lombardy poplar, Pembroke College Sports Ground, TL437572, 3.vi.1987. Devon: edge of reedbeds, Slapton Marsh NR SX8144, 3.vi.1978 (JC). Hants: Lyndhurst, 22.vi.1872 (JEC); New Forest, 14.viii.1901 (FCA); New Forest, 8.vii.1907 (JJFXK); Matley Bog, New Forest, 15.iv.1953 (CNC); Park Ground Inclosure, New Forest SU303064, 30.v.1980 (IP); Royden Woods near Brockenhurst SU307013, 25.vi.1988 (IP). Herts.: *in cop* Felden, 18.vii.1894 (AP); single male ditto, 17.ix.1897 & 10.vi.1899 (AP); Knebworth, 10.vi.1923 (FWE). Hunts.: disused railway cutting Pingle Cutting NR TF215815, 27.vi.1984 & 26.v.1985 (JC). Kent: Footscray, 7.vii.1869 (NHML); Hook Farm, Bromley TQ4167, 26.viii.1964 (PJC); Crofton Heath, Orpington TQ4366, 6.x.1966 (PJC); Blean Woods NNR TR16, 3.ix.1967 (PJC); Cudham, 6.viii.1969 (RIVW); Cromers Wood near Sittingbourne TQ905605, 29.vii.1983 (LC); Mincing Wood, Blean near Canterbury TR1160, 2.vi.1983 & 31.vii.1983 (LC); Crockham Wood, Dunkirk near Canterbury TR076606, 26.ix.1983; Claypits Wood, Dunkirk near Canterbury TR074595, 26.ix.1983 (LC); Carter's Wood, Hamstreet TR0033, 19.vi.1984 (LC); Denstead Wood, near Charlham Hatch TR0857, 22.viii.1985 (LC); Sladden Wood, Alkham near Dover TR258428, 19.vi.1988 (LC); Ashford, Hothfield TQ9745, 18.vii.1987 (WAE). N. Yorks.: Ashberry Pastures, vi.1977 (PS); Dallowgill, Ripon SE1871, 7.vii.1979 (WAE). Oxon: village garden, Goring on Thames, 16.v.1961 (JC). S. Yorks.: Slackcotes near Delph, puparia coll. from marshy soil with coltsfoot, iv.1964, emerged 8–12.v.1965 (PS); Edlington Wood near Doncaster, 22.vii.1965 (and associated female) (PS); Roche Abbey near Maltby, 15.ix.1965 (PS); Silverwood, Rotherham SK4873, 15.v.1977 (WAE); Cantley Park, Doncaster, 25.v.1977 (PS); 2 males Low Hall Wood, Sheffield SK330967, 20.vii.1977 (SA); Greno Wood, Sheffield SK324958, 25.vii.1977 (SA); Ecclesall Woods, Sheffield, 3 males SK325826, 15.vi.1980 & one male SK322818, 25.vi.1980 (SW); Pot Ridings Wood, Sprotbrough, Doncaster 27.vii.1991 & 28.vii.1991 (AG). Staffs.: five swept from large felled beech trunk by river bank, Dimmings Dale SSSI, surrounding habitat is secondary woodland (sycamore and silver birch with bracken), SK053431, 27.vii.1990; two specimens of *L. pallidiventris* s.s were also taken (Nature Conservancy Council per D. Denman). Suffolk: Sussex Lodge, Newmarket, 18.vii.1911 (JEC) & 31.viii.1912 (CY); Cavenham Heath NNR TL760725, 13.vi.1988 (IP). Warks.: Sutton Park (acid grassland/heathland with wet woodland) SP0998, 31.v.1990 (SJF); Herald Way Marsh (disturbed ground with carr, scrub and marsh) SP3776 11.vi.1990 (SJF). West Yorks.: four males taken on 30.vii.1927 (JW). The specimens have the letter P on the data label; according to a list of site codes made by the collector, P is either Park Wood, Keighley or Pollington near Snaith, both in West Yorks. Worcs.: Tarrington, 31.vii.1903 (CY).

Wales. Denbigh: Rhyd y Crellau, Betws y Coed, 30.vii.1971 (PS); at light at same locality, 8.viii.1975 and 2 males at light at same locality, 9.viii.1975 (PS).

Scotland. Aber.: Crathie Wood, Aberdeen, 11.vii.1970 (PS). Dum.: Spitalriding, Annan, 25.ix.1992 (AG). Easter Ross: Culbin Sand Hills, Lairn, viii.1899 (CY); Loch Loy, Culbin Sands (calcareous seepage dominated by *Schoenus nigricans* passing into scrub and bordered by birch woodland) NG9358, 17.vii.1991 (AG). Inv.: Spey Bridge, 29.vi.1905 (JEC); Falls of Tarnash, 9.vii.1936 (RLC). Islay: *in sycamore wood*, Baleachdrach, Ballygrant NR4264, 11.viii.1992 (AG), in car in Ballygrant Inn car park, Ballygrant, 13.viii.1992 (AG). Perth.: Rannoch, 19.vii.1927 (JEC coll.), Black Wood of Rannoch, 17.vi.1992 (AG). Rhum: Kinloch, 3.vi.1960 (AB). Skye: Coille Thogabhaig (birch-alder woods with flushes) NG614120, 11.vii.1991 (AG); 2 males Dunvegan Castle Woods NG2439, 9.vii.1991 (JC); Loch Suardal (fen with *Carex*, *Eriophorum*, *Eleocharis* and *Phragmites* with woodland fringe on eastern side)

NG259512 9.vii.1991 (central point) (AG). Stirl.: Mugdock Country Park, 18.vi.1992 (AG). Sutherland: Lochinver, 21.v.1911 (CY).

From the records amassed it would seem that *L. stylata* is a common and widespread species in Britain. It appears to be the most frequent of the three species.

Lyciella subpallidiventris Papp, 1979

Very similar to *pallidiventris* and only distinguishable on the male genitalia. Gonites shorter than *pallidiventris*, not or barely extending beyond surstyli (Fig. 2). Papp (1979a) provides a further illustration of the male genitalia.

L. subpallidiventris is so far known from Hungary, (West) Germany and Estonia. Records available to me are as follows.

England. Glos.: Beaudesert Park School, Stroud, 23.ix.1960 in light trap (ACP). Hants: New Forest, 10.vii.1900 & 19.ix.1900, 2 males (FCA); Milton, 30.vii.1907 *in cop* (WW). Herts.: Felden, 6.vii.1899 (AP). Kent: Cromers Wood, near Sittingbourne TQ905605, 29.vii.1983 (LC); Mincing Wood, Blean TR1160, 31.vii.1983 (LC); Mersham-le-Hatch, near Ashford TR0540, 18.viii.1983 (LC); Darenth Wood, 27.vi.1987 (AG).

Eire. Wicklow: Glendalough T19, 16.iv.1968 (PJC).

Scotland. Skye: Dunvegan Castle Woods NG2439, 9.vii.1991 (AG).

Lyciella pallidiventris (Fallén, 1820)

Male genitalia as in Fig. 3 with the gonites of more or less equal length or with the right slightly longer and both strongly curved apically. Papp (1979a) provides further illustrations. Records available to me are as follows.

England. Berks.: Windsor Forest, 30.vi.1971 (PJC). Cambs.: Chippenham Fen, 11.iv or vi.1948 (JEC). Hants: New Forest, 21.vi.1869 (no collector given); 16.ix.1900 (FCA). Oxon: Crowell Hill, 20.ix.1970 (PJC). Kent: Bysing Wood near Faversham TQ998623, 28.vi.1986 (LC); Bredgar near Sittingbourne TQ893597, 5.ix.1986 (LC). S. Yorks.: signal box, Wharncliffe Wood (43/311937) *in cop*, 5.ix.1980 (AUB). Staffs.: two from fallen beech trunk by river bank, Dimmings Dale SSSI, 27.vii.1990 (taken with *L. stylata*; see this species for more details of the collecting site) (DD).

Remm & Elberg (1979) illustrated variation of the male genitalia of *L. pallidiventris*. Their figures however, are attributable to *L. pallidiventris* s.s. (Fig. 27E), *L. stylata* (27A,B,D), and *L. subpallidiventris* (27C). Collin (1948) also referred to the 'very considerable variation in the length of the genital rods' in *L. pallidiventris*. He did not separate specimens of this species group which is unusual given that he did for a much smaller perceived variation in other species. Variation in the lengths of the gonites have been noted whilst examining specimens of the three species covered in this paper and it has proved difficult to ascribe some individuals to species. Further studies are required to prove whether these are all good species. I would therefore welcome male-associated females, especially those taken *in cop*, and reared material.

ACKNOWLEDGEMENTS

I am grateful to Bill Ely, Keeper of Natural History, Clifton Park Museum, Rotherham and Miss Margaret Hartley, Keeper of Natural History, Cliffe Castle Museum, Keighley for arranging for me to examine the collections of the latter institution, to Dr László Lapp and Evi Remm for advice and information, to Oxford University Museum and the Natural History Museum, London, and to the entomologists named for their records and assistance.

Collectors' abbreviations: FCA (F. C. Adams); SA (Susan Ashurst); AUB (Austin Brackenbury); AB (Allan Brindle); PJC (Peter Chandler); LC (Laurence Clemons); RLC (R. L. Coe); JC (Jon Cole); JEC (James Collin collection, Oxford); CNC (C. N. Colyer); DD (David Denman); FWE (F. W. Edwards); WAE (Bill Ely); SJF (Steven Falk); AG (Andrew Godfrey); JJFXK (J. King); NHML (Natural History Museum London); IP (Ivan Perry); AP (A. Piffard); ACP (A. C. Pont); PS (P. Skidmore); RIVW (Richard Vane-Wright); SW (Susan Watson); WW (W. Wesche); JW (John Wood); CY (Colonel Yerbury).

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Remm, F. & Elberg, K. 1979. Terminalia of the Lauxaniidae (Diptera) found in Estonia, Latvia and Lithuania. *Dipterologilisi Uurimusi, Eesti NSV Tead. Akad.* **66**–117.

SHORT COMMUNICATION

***Dolichopus caligatus* Wahlb. (Diptera: Dolichopodidae) new to eastern England.**—During the Norfolk field meeting of the Diptera Recording Schemes I visited Burgh Common, Fleggburgh, (TG445130) on 5.vii.1993 in company with Jonathan Cole and Keith Porter.

Subsequently Dr Porter handed to me a male *Dolichopus* he had collected during the visit and which I identified as *D. caligatus*, a species hitherto unreported in eastern England. Dr Porter kindly allowed me to retain the specimen in my own collection and it was exhibited at the annual meeting of the Diptera Recording Schemes in November.

Assis Fonseca E.C.M. (1978. Diptera Orthorrhapha Brachycera. Dolichopodidae. *Handb. Ident. Br. Insects* **9(5)**: 24), records the distribution of this species as limited to five British localities only, all from northern Scotland, three of the records being prior to 1913.

In 1984 the species was found in four localities on the Isle of Lewis, the typical habitat seeming to be the edge of peaty lochs and beside streams in peat bogs, (MacGowan, I. 1986 *Entomologist's Mon. Mag.* **122**: 213).

The species was found at Traeth Dulas (Anglesey), in 1987 by Peter Chandler (pers. comm.), and there is an undated record for Silverdale (N. Lancs.), by Harry Britten who died in 1954.

The latter record appears in *The Diptera of Lancashire and Cheshire*, Part 1, by L. N. Kidd and A. Brindle, published by the Lancashire and Cheshire Fauna Committee in 1959. This very useful reference work may have been overlooked by Mr Fonseca when he was compiling the distribution details for the 'Handbook', because there are similar omissions which come to light from time to time.

The Norfolk habitat was along the side of a drainage ditch in an overgrown grazing marsh; no other specimens were found on the occasion of our visit and the single specimen constituted the only record during the week.—Roy Crossley, 1 The Cloisters, Wilberfoss, York YO4 5RF.

SOME RARE ACALYPTRATE DIPTERA TAKEN IN RECENT YEARS

ANDREW GODFREY

Ecosurveys Ltd, Priory Lodge, Hagnaby, Spilsby, Lincolnshire PE23 4BP.

During 1991, 1992 and 1993 I have been fortunate to find several rare and little known acalyptate Diptera. These include the second British specimen of *Pseudopomyza atrimana* (Pseudopomyzidae), a third locality and the first British inland records for *Parochthiphila coronata* (Chamaemyiidae), and recent records of *Stenomicra delicata* (Stenomicridae). In addition, a number of interesting species, collected during the same period, have been identified in material sent to me for identification. Peter Chandler has also kindly added his records of *Stenomicra delicata*. Details of these are given below.

Typhamyza bifasciata Wood (Anthomyzidae)

A single female was taken by beating *Carex paniculata* L. tussocks at the centre of a dried-out pond vegetated by *Typha* at Thompson Common, Norfolk (Grid Reference TL 99) on 11.viii.1991. More recently, I took a single specimen by sweeping a *Typha*-rich ditch on Neatscourt Marshes, Isle of Sheppey, Kent (TQ918714) on 25.vi.1993. I have also identified another female from Norbrigg Pool, Derbyshire SK4475 taken on 5.vii.1992 by Derek Whiteley (specimen in the collection at Weston Park Museum, Sheffield). An increasing number of recent records (for example: Ismay, 1981; McLean, 1987; Withers, 1987) suggests it is more widespread and not as rare as was previously thought. Rohacek (1992) has recently provided an excellent account of the taxonomy, morphology and ecology of this species.

Stenomicra delicata (Collin) (Stenomicridae)

This obscure and very rare fly was described as new to science by J. E. Collin (1944) from a small number of specimens taken from a dried-up artificial pond in a garden in Newmarket in June and July 1942 and 1943. As far as I am aware, the only published records since are from Czechoslovakia (Papp, 1978; Rohacek, 1983). Papp recorded a single specimen whilst Rohacek took two females at light. It is currently given Red Data Book Status 2 in Britain (Falk, 1991).

I took a single female of this species whilst examining the tussocks of *Carex paniculata* at Holwell Mouth SSSI, Leics. (SK724245) on 1.ix.1991. The tussock sedge grows by the streamside in a small valley and is surrounded by an area of marshy ground dominated by *Carex riparia* Curtis, *Filipendula ulmaria* (L.) Maxim. and *Equisetum telmateia* Ehrh. with sallow carr nearby and throughout the valley. The streams here are spring fed. Several other interesting flies were taken in the tussocks including *Stilpon graminum* (Fall.), *Drapetis assimilis* (Fall.), *Elaphropeza ephippiata* (Fall.), *Elachiptera brevipennis* (Meig.), *Oscinisoma cognata* (Meig.) and *Trimerina madizans* (Fall.).

Two males and six females of *S. delicata* were taken from *Carex paniculata* tussocks at Barnby Marshes, Suffolk (TM482904) on 7.vii.1993. One male and one female were taken a few days later amongst *Carex pseudocyperus* L. and *Deschampsia caespitosa* (L.) P. Beauv. in a damp ditch at Swangey Fen, Norfolk (TM013933) on the 10.vii.1993. Peter Chandler has informed me that he has taken this species from *Carex paniculata* at two sites in Hampshire—The Moors, Bishop's Waltham on 13.vii.1990 (one male, two females); and Greywell Fen on 15.vii.1990 (one male).

Since *S. delicata* was described, a second species, *S. cogani*, has been described as new to science from Britain (Irwin, 1982). There are at least two further undescribed species from Europe (J. Ismay, pers. comm.; Andersson, 1991).

Parochthiphila coronata (Loew) (Chamaemyiidae)

This species was swept in small numbers from short grassland at Blackburn Meadows (also known as Tinsley Sewage Beds), Sheffield, South Yorks (SK4191 & SK4192) on 29.vii.1991 and on 18.vii.1993. It was only previously recorded in Britain from two localities on the coasts of Essex and Norfolk (McLean, 1980) and is accorded Red Data Book Status 1 (Falk, 1991). The male genitalia were checked since there are several further *Parochthiphila* species in Europe and the CIS, and because the Sheffield specimens are the first inland records for this species in Britain (the species occurs inland throughout the rest of the Palaearctic, however). Differences in the genitalia were detected using the work by Tanasijtshuk (1986) but they are very similar to the figures given by Raspi (1983). The ecology of *P. coronata* has been described by these workers. The larvae have been recorded feeding on coccids at the base of *Elymus repens* (L.) Desv. ex Nevski and *Ammophila arenaria* (L.) Link. (Grasses from the exact site of the Tinsley specimens have been identified for me by Mr Tim Smith and comprise *Agrostis stolonifera* L., *Dactylis glomerata* L., *Lolium perenne* L., *Holcus lanatus* L. and *Arrhenatherum elatius* (L.) P. Beauv. ex J. S. & C. Presl.)

Pseudopomyza atrimana Frey (Pseudopomyzidae)

A male of this species was taken by sweeping on a visit to Loch na Dal, Isle of Skye (NG704160) on 11.vii.1991. This obscure fly has been given Red Data Book Status 1 (Falk, 1991) and is the second (first male) British specimen. The species was added to the British list by Chandler (1983) from a female taken in Kent in 1972.

The site is an area of open seepage with *Sphagnum*, *Eriophorum*, and *Myrica* passing into birch and sallow woodland on a gentle slope at the head of the Loch. Unfortunately it is not clear whether the fly came from the open area or from the woodland. The fly was recognized as unusual when sorting out the catch in the evening and it was subsequently identified as this species by Dr John Ismay and Peter Chandler. The genitalia compare well with that illustrated by Frey (1952) and is illustrated in Fig. 1.

Since Chandler (1983) published his record, the species has also been recorded from Hungary (Soós & Papp, 1984) and a second record for Czechoslovakia has been published (Frouz & Maca, 1985).



Fig. 1. *Pseudopomyza atrimana*, posterior part of male abdomen. Bar 1mm.

Periscelis annulata (Fall.) (Periscelidae)

A male was swept by my collecting partner, John Mousley, from Ballinluig Shingle Island on the River Tay near Pitlochry (NN9754) on 15.vi.1992 and subsequently passed to me in the evening along with other 'rubbish'. This species like all periscelids is rarely recorded and it is currently regarded as notable by Falk (1991). The larvae of the Periscelidae are associated with oozing tree sap (see, for example, Papp, 1988).

Asteia elegantula Zett. (Asteiidae)

A single specimen of this rare species was swept from the overhanging bank of a small stream near South Fearn (NG5835) on the Isle of Raasay, Inner Hebrides on 8.vii.1991. The partially dry stream bed comprised large water-worn stones and pebbles, no doubt derived from the boulder clay through which the stream was incised. The stream banks were approximately 2 feet high and vertical, with gentle bracken-covered, landslipped slopes above. Chandler (1978) records the fly from Moray, Ross and Herefordshire, the most recent being from Grantown-on-Spey in 1945. Irwin (1985) recently recorded it from Norfolk and Plant (1989) recorded it from Essex.

This species is given Red Data Book Status 2 in Falk (1991). The life history of *Asteia elegantula* was described by Freidberg (1984) from observations in an Israeli garden where the insect proved to be common. Freidberg does, however, state his specimens may represent another species.

Pseudopachychaeta heleocharis (Nartshuk) (Chloropidae)

A female was swept on the south side of the main lagoon at Blackburn Meadows, Sheffield, South Yorks (SK411918) on 31.vii.1991. The vegetation here includes *Phragmites*, *Glyceria*, *Typha*, *Eleocharis* and *Potentilla palustris* (L.) Scop. Ismay (1991) recently added this to the British fauna.

Crumomyia pedestris (Meig.) (Sphaeroceridae)

A female of this very distinct and infrequent brachypterous fly was taken in a pitfall trap placed on the edge of *Carex* marsh by the River Ock, near Noah's Ark public house, Abingdon, Oxon SU441960. The trap was in position for two weeks and was emptied on 14.vii.1992.

Neottiophilum praeustum (Meig.) (Neottiophilidae)

A female was identified in material sent to me by John Mousley. This specimen was swept along the River Babingley, Flitcham, Norfolk TF7326 on 19.v.1992. The larvae are parasites on nestling passerines; a list of hosts is given by Owen (1957). Adults are rarely seen although Irwin (1987) recently recorded the species from Norfolk.

Parydroptera discomyzina (Collin) (Ephydriidae)

A single male was found in a pitfall trap at Iwade Marshes, Iwade, Kent (TQ911690). The trap was put down on the 26.vi.1993 and the contents recovered on 5.vii.1993. The trap was placed in herb-rich grazing marsh.

This species was originally described by Collin (1913) from Rye in Sussex and from Southwold in Suffolk. Ismay (1980) has published details of further specimens taken at Rye. I know of no other British records. The species is given Red Data Book Status 2 in Falk (1991).

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ADHESION MARKS ON THE ABDOMEN OF PUPAL CHIRONOMIDAE (DIPTERA)

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Smooth patches on the abdominal tergites and sternites (Fig. 1) of chironomid pupae have been called 'Fensterflecken' ('window marks') (Thienemann, 1944), and, more recently, 'Muskelmale' ('muscle marks') (Hirvenoja, 1973). Sæther (1980), in his glossary of chironomid morphology terminology favours the term muscle marks. However, Dr M. Hirvenoja informs me that these are inaccurately called 'Muskelmale', and suggests a return to 'Fensterflecken', thereby prompting the following investigation.

MATERIAL AND METHODS

Pupae and fourth instar larvae of *Chironomus annularius* auctt. were collected from a rain-water butt. Larvae showing different stages of pupal development within them were selected and killed in either 70% isopropanol or Bouin's solution (picric-formol-acetic). They were then cut longitudinally (either vertically or horizontally), or transversely. Some of the preparations were transferred to orcein acetic, until the musculature was stained reddish-purple. The pupae were prepared for examination in the same way. All the specimens were examined under the microscope in 70% isopropanol; the more revealing examples were further dehydrated in 100% isopropanol and slide-mounted in Euparal.

OBSERVATIONS

The lateral band of dorsoventral muscles in each abdominal segment of the pupa is attached to the cuticle beneath the lateral marks of tergum and sternum, but

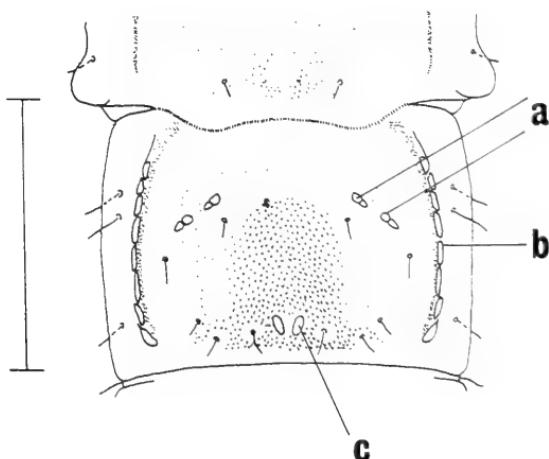


Fig. 1. Segment III, dorsal view, of the pupal abdomen of *Chironomus annularius*. a: anterior adhesion marks; b: row of lateral adhesion marks; c: posterior adhesion marks. Scale line 1 mm.

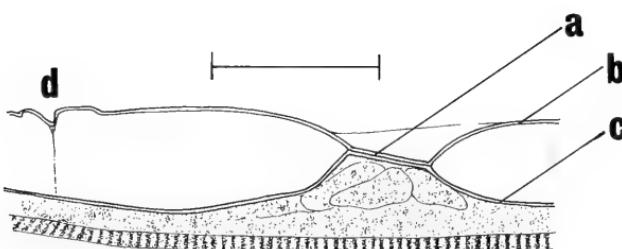


Fig. 2. Posterior adhesion point in late fourth instar larva of *Chironomus annularius*. a: adhesion point between larval and pupal cuticles; b: larval cuticle; c: pupal cuticle; d: posterior margin of abdominal segment V. Scale line 0.1 mm.

there are no muscle attachments to the cuticle beneath the anterior and posterior marks.

In late fourth-instar larvae, the nearly fully formed pupal cuticle remains attached to the otherwise apolysed larval cuticle at all the points that remain smooth upon ecdysis (Fig. 2). At this stage the larva is still feeding, and its movements are still larval: it crawls using its anterior and posterior parapods, and remains capable of curling into a spiral when disturbed. Shortly before ecdysis, the lateral adhesion points are seen to be separated from the larval cuticle. The separation of the cuticles at the anterior and posterior marks occurs later, upon ecdysis.

DISCUSSION

The late fourth-instar chironomid larva is a complex animal. In *Chironomus* the pupal head (and the developing adult head within it) forms in the anterior thorax of the larva (Miall & Hammond, 1900). (In many other chironomids the pupal head develops partly in the posterior part of the larval head and partly in the anterior thorax.) Apolysis of the larval cuticle is progressive, beginning at the developing wing and leg sheaths, subsequently spreading around the thorax and along the abdomen. Even when the pupa is nearly fully apolysed and adult features can be seen within it, the animal is still behaving as a larva and continues to feed. Final preparation for ecdysis is very rapid. Extensions into the larval head and parapods are withdrawn. The pupal abdomen becomes dorsoventrally flattened, presumably by the contraction of the lateral dorsoventral muscle bands. At the same time the pupal cuticle comes away from the larval cuticle at the lateral adhesion points. Movements now are the dorsoventral undulations characteristic of the pupa, which serve to drive the pupa forwards in the larval cuticle and out through the split dorsal suture of the larval thorax. During this process the pupal and larval cuticles pull apart at the anterior and posterior adhesion points.

The adhesion points between the pupal and larval cuticles enable the larva to transmit its movements to the substratum from musculature now enclosed within the pupal cuticle. The time between the cessation of larval feeding and the emergence of the imago is thus greatly reduced, for the adult is already nearly fully formed when the pupa leaves the larval exuviae. (In *Paratanytarsus grimmii* Schneider imaginal eclosion may take place only 25 minutes after pupal ecdysis (Krüger, 1941).)

The smooth areas on the abdomen of pupal Chironomidae, previously called Fensterflecken or Muskelmale/muscle marks are more accurately termed adhesion marks.

ACKNOWLEDGEMENT

I thank Dr M. Hirvenoja for stimulating this investigation.

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BENHS FIELD MEETING

Oakers Wood, Dorset, 22 May 1993

Leader: Mick Parker. Eight members turned up for the daytime meeting, followed by seven for the moth trapping session. Conditions were cloudy, slightly damp, but warm and as a result, it was decided to work the outskirts of the main locality, heading north through mixed woodland, west through wet heath, up on to dry heath, then south into the main oak wood which by this time had dried out.

Thirteen species of sawfly were noted plus a small number of other hymenoptera of which *Vespa crabro* (L.) was the most obvious. The hoverfly list was rather better with 23 species, including the RDB 1 species *Chrysotoxum vernalis* (Leow), caught sitting on bracken. Other uncommon species were: *Brachypalus laphiformis* (Fall.), *Brachyopa scutellaris* (R.-D.) and *Criorrhina asilica* (Fall.), all on *Crataegus monogyna* L. flowers and *Pelecocera tricincta*, (Meig.), which was swept. None of these were new to the Oakers Wood list.

The evening session produced five moth traps. The evening was warm with frequent showers. A total of 59 macros and 6 micros were recorded of which the most notable were: marbled pug (*Eupithecia irriguata* Hübn), ringed carpet (*Cleora cinctaria* D. & S.) and the little thorn (*Cephalis advenaria* Hübn). As the evening wore on the showers became heavier and we were worried that some M.V. bulbs might start exploding—one did, mine! As I forgot to pack a spare, my collecting ceased about midnight. Most of the moth records are due to the rest of the group, and to them I am grateful. Thanks are also due to Mr John Shelly of Oakers Wood House for permission to hold the field meeting.

BENHS INDOOR MEETINGS

12 October 1993

The President, Dr D. LONSDALE, announced the deaths of Mr F. Wright and Mr P. S. Crowhurst.

Mr I. D. FERGUSON showed a larva of the clouded magpie moth, *Abraxas sylvata* (Scop.). This was one of eight larvae obtained by beating at High Elms near Orpington, Kent. One larva had succumbed to a parasitoid, the other six had pupated. Colin Plant in *The larger moths of the London area* (1993) states that "any breeding populations of this attractive moth in the London area should be rigorously protected". Mr Ferguson also showed a sample of rice grains from his kitchen that had become infested with psocids.

Stephen Muddiman, John Bouscal Parker, Colin Leslie Grace, Derek George John Telfer and Christopher Robert Spilling were elected as members.

Mr M. Simmons said that a light trap at his home in Crowborough, Sussex, had caught about 20 species of moths on the previous Sunday night, 10.x.93, in spite of the heavy rain. Seventeen species had been taken on the following night including a specimen of the delicate moth, *Mythimna vitellina* (Hüb.) (Lepidoptera: Noctuidae).

Mr M. OATES then spoke on the New Forest as it used to be and how it has developed during the present century. The talk was illustrated with colour transparencies and readings from contemporary accounts of the Forest in former times. Collecting insects became a popular pastime during the Victorian era when the development of the railway system made the Forest accessible to people living in London and elsewhere in Southern England. During the collecting season hotels in the main centres of Lyndhurst and Brockenhurst were heavily used by collectors and dealers, and local people found employment as guides and providers of livestock and pinned specimens. There was considerable rivalry between collectors and some ill feeling between them and the dealers, with butterfly aberrations being highly sought after.

In 1850 the Forest authorities passed an order aimed at controlling fallow deer and excluding them from the inclosures. In the following years their numbers were drastically reduced and the reduced grazing pressure allowed increased growth of the ground flora, with the rides becoming lined with brambles. Butterflies benefitted from the greater abundance of nectar sources and were present in prodigious numbers. 1888 was a superb year, with the hot summer allowing univoltine species to produce two generations. Even poor years during that period would be considered good by modern standards. Collecting trips could, however, be marred by the attentions of excessive numbers of biting flies.

The nature of the Forest was greatly changed by felling during the 1914–18 war. The 1923 Transfer of Woods Act resulted in the New Forest being handed over to the Forestry Commission in the following year. Their mandate was to produce commercial timber in order to reduce the nation's dependence on imports. Some conifer planting had been done in the Forest in the 19th century but this was greatly increased after the Forestry Commission took over. By 1937 the broad-leaved woodland had been reduced to 54%. Further changes took place during the second world war when parts of the Forest were used for airfields, bombing ranges and arable crops. Alder buckthorn was cut for making charcoal for gas masks. 1941 and 1942 appear to have been the last great years for butterfly aberrations in the Forest. The quality of the habitat and butterfly numbers were declining.

During the 1950s the Forestry Commission used heavy machinery to clear ditches and control vegetation in the rides. The fallow deer population was recovering

and grazing out the sallow and brambles. In 1964 cattle, ponies and other livestock were allowed into the inclosures, adding to the grazing pressure. By 1970 about 70% of the Forest had been coniferized, despite a declaration in 1928 to keep a 60:40 ratio of broad-leaf to conifer trees. In 1982 a halt was called to the planting of more conifers and of felling mature broad-leaf woods. This ironically may have resulted in further declines, since the habitat provided by felled and replanted areas is now denied to those butterflies dependent on it. Although some good areas still exist, the New Forest today is largely poor for butterflies. Mr Oates showed slides of many of the butterflies recorded in the Forest, described their current status and outlined the reasons why many of them had declined.

In 1985 the Forestry Commission was given a new remit to encourage conservation in its forests. During the late 1980s it began replacing fences and gates but overgrazing remains a problem. Areas which have been cleared of conifers are less favourable for insects than similar clearing in broad-leaf areas. This is probably due to a reduction in the seed bank in the soil and increased acidification while under conifers. The application of conservation measures is being restricted by limited funding. The possibility of the government privatizing the Forestry Commission raises the interesting question of whether the New Forest would be better managed if it remained in their care, or whether it should be passed to another organization such as the National Trust.

9 November 1993

The President, Dr D. LONSDALE announced the death of Mr P. W. Cribb.

Dr D. LONSDALE showed a live specimen of the orange ladybird, *Halyzia 16-guttata* (L.) found on 9.xi.93 on a poplar in an experimental plot at Alice Holt Forest, Hants. This is a widespread species, having been found as far north as northern Caithness, but this was the first occasion the exhibitor had seen it at Alice Holt. It is one of a few British ladybirds that feeds on fungi, such as mildews, rather than preying on aphids.

Mr S. MILES drew the meeting's attention to some recently received publications produced by the Department of the Environment, the Joint Nature Conservation Committee, and non-governmental organizations in response to the Rio Conference on Biodiversity. Also on display were minutes of a recent meeting of the Joint Committee for the Conservation of British Invertebrates, together with a report on the Committee's activities by the National Trust's representative. Mr Miles also displayed a copy of a report by Wildlife Link on the future ownership of Forestry Commission woodlands. Mr Softly asked if a summary of these reports could appear in the Society's journal. The President thought that editors were able to make use of this material. Mr Miles invited members who are interested in forming a conservation action group to contact him.

There then followed a report and discussion on the Society's 1993 Annual Exhibition. Mr M. SIMMONS said that the Exhibition had been well attended with numbers of both members and visitors slightly up on the previous year. The number of exhibits compared favourably with previous years, with Coleoptera being particularly well represented. Mr D. HACKETT suggested that name badges should be issued to people attending. As a new member he would have found it helpful in locating exhibitors of insects which were of particular interest to him. Mr R. MORRIS noted that the space allocated to Diptera and Coleoptera had been somewhat cramped. The President raised the topic of the format of exhibits; he personally

preferred exhibits that gave additional information about the insects' biology or ecology. The Exhibition notice had been reworded this year to discourage the showing of long series of insects taken from a site in one season. A discussion took place on the practical application of this ruling with reference to some of the exhibits shown at the Exhibition.

Various members then showed some of their slides.

Dr J. MUGGLETON showed slides taken during a visit to the Sierra de Grados mountain range in Spain in June 1993. These depicted various wild plants, including narcissus, paeony, dwarf lupin, *Lavandula stoechas* and *Endymion hispanicus*. The invertebrates included various beetles, crickets, the local stick insect *Leptynia attenuata* found in a new locality, the mantid *Empusa pennata*, a centipede, and some termites found under a rock. After crossing the border into Portugal, Dr Muggleton also photographed a large solitary wasp, probably *Scolia flavifrons*, that had alighted on a car window, and a mating pair of grasshoppers that were superbly camouflaged against the stony ground.

Mr R. SOFTLY showed some examples of the lesser yellow underwing moth, *Noctua comes* ab. *sagittifer* Cockayne taken at light on the Isles of Scilly, together with a specimen close to this form taken at Hampstead Heath. He also showed photographs of the dark spinach, *Pelurga comitata* (L.), a species not in the Agassiz list of Scilly Lepidoptera, and an as yet unidentified form of an *Idaea* sp. A typical larva of the chamomile shark, *Cucullia chamomillae* (D. & S.) was compared with an example found on Scilly. It was almost entirely white and was photographed feeding on the white flowers of mayweed where its coloration gave it excellent camouflage.

Mrs F. MURPHY showed slides of various spiders and plants seen on a visit to the Côte Sauvage, France, in the summer of 1993. In the previous autumn she had visited Singapore and Queensland, Australia, where she photographed various plants, spiders, lizards and green tree ants. She closed her display by showing slides of members taken at the Pelham-Clinton building at Dinton Pastures on 20 September 1992.



Members at Dinton Pastures, 20 September 1992. Left to right: Tony Pickles, John Muggleton, Peter Chandler, Ian McLean. Photo: F. M. Murphy.



Dinton Pastures, 20 September 1992. While passers-by look on bemused, Roger Morris searches unsuccessfully for the spider *Nuctenea sclopetaria* (Clerk), webs of which were seen on the bridge balustrade. Photo: F. M. Murphy.

Mr N. A. CALLOW had visited eastern Nepal in March and April and showed slides of the area, including butterflies drinking from wet mud and *Primula irregularis* in flower at the snow line. This was followed by photographs taken mainly in Britain of a wide range of insects, spiders, wild flowers and birds. Some of these illustrated insect behaviour, such as brown ants attending black aphids, a dolichopodid fly drinking from a water droplet and a solitary wasp, *Symmorphus* sp., flying off with a figwort weevil larva, *Cionus* sp., clasped in its jaws and front legs. He showed a series of photographs taken of two slugs, *Arion ater* (L.), feeding on a dead earthworm, which was also being eaten by a social wasp. A black ant nearby appeared to be threatening the wasp, which was responding by whirring its wings.

Mr D. HACKETT showed a slide of the buprestid beetle *Agrilus pannonicus* (P. & M.) photographed on oak bark near its characteristic semicircular emergence hole. This beetle has become widespread in NE London in recent years. Also shown were slides of the purple hairstreak and the white-letter hairstreak butterflies taken in the grounds of Alexandra Palace. The former is local in London and Alexandra Palace is a new site for the white-letter hairstreak. The remaining slides were of an *Orthosia* sp. larva on buckthorn, a larva of Blair's shoulder knot, *Lithophane leautieri* (Boisd.) on a *leylandii* hedge and a drinker moth, *Philudoria potatoria* (L.) recently emerged from its cocoon.

14 December 1993

Mr A. J. HALSTEAD showed a live queen *Dolichovespula media* (Retz.) (Hymenoptera: Vespidae) found 5.xii.93 in a wood at Knaphill, Surrey. It was one of two found separately hibernating on the undersides of logs on the ground. The queens of this species, which was first recorded in Britain in 1981, presumably require hibernation sites with a high humidity if this is a typical situation for this species.

Mr R. A. JONES showed the local hoverfly *Scaeva selenitica* (Meig.) found sunning itself on a pine trunk at The Chart, Limpsfield, Surrey, on 18.xi.1993. This large, scarce hoverfly was previously regarded as solely a migrant, but is now considered to be resident, having been recorded as breeding here. When

found, the glossy black of the abdomen and contrasting yellow bands were very bright, suggesting that the specimen was freshly emerged rather than freshly blown from abroad.

He also showed several specimens of *Carpophilus sexpustulatus* (F.) (Coleoptera: Nitidulidae) found under fungoid beech bark at Knole Park, Sevenoaks, on 15.xi.1993. Several *Carpophilus* species are cosmopolitan, and are regularly introduced into Britain in stored food products. Such was the case with this species at the turn of the century, when only two (imported) specimens were known. By the 1930s it had been found out of doors, although only very rarely. It has since spread and although not very common is recorded across a wide range of sites, often in abundance. In Knole Park on this occasion it was very common under bark infected with *Bulgaria inquinans*, the black bulgar fungus also known by the delightful name 'rubber buttons'.

Mr C. B. ASHBY showed a home-made slide viewer which accommodates six 35-mm transparencies side by side above a light box lit with a small fluorescent tube. Above the transparencies was a lens mounted on two rails so that it could be slid along to view each slide in turn. The device is particularly useful for comparing similar slides in order to select the best exposure and image. The slides used to demonstrate the viewer were of Roesel's bush cricket, *Metrioptera roeselii* (Hagenb.). This species has become more widespread in southern England in recent years and the slides were taken at a recently discovered site at Cherry Orchard Farm, Ewell, Surrey, where it was discovered by Dr I. Menzies.

Mr R. SOFTLY showed a live sawfly larva (subsequently identified as a *Dolerus* sp.) that had crawled into an actinic light trap he had been running recently in his garden at Hampstead. The larva had been feeding in captivity on the leaves of pendulous sedge, *Carex pendula* Hudson, a plant that was growing near the trap site. The majority of sawflies overwinter as non-feeding prepupal larvae in the soil and subsequently pupate during the spring.

Mr R. UFFEN said that he had also recently found a sawfly larva feeding on *Carex*. It appeared to be a different species to that shown by Mr Softly.

The following persons were elected as members at the December Council meeting: Stephen Hallam, Peter G. Kelly, Michael Dockery, William G. Kittle, Michael E. New, Nigel L. Sawyer, Stuart W. Campbell, Thomas D. Sleep, David B. Spencer, Anthony P. Pittaway, David F. Lloyd, Bernard Verdcourt, Charles Watson, Brian J. Warne, David John Slade, Stuart P. M. Roberts, John Derek Baston, Brian Eversham and Adrian Barnes; the Royal Society for the Protection of Birds (Scotland) was elected as a corporate member and James Brian Prout was elected as a life member. Existing members Ken Merrifield and Henry S. Barlow have converted from ordinary to life membership.

Mr R. HAWKINS reported that the hoverfly book had been reprinted and was now available again.

Dr J. ISMAY then spoke on the subject of an entomologist in Papua New Guinea, where he had worked as the only insect taxonomist with the Department of Agriculture between 1980 and 1986. He showed a series of slides to indicate the variety of habitats found on the island, including mangrove swamps, agricultural activities ranging from plantation crops to mountainside smallholdings, rain forest and hill tops. The fauna of Papua New Guinea was depicted with a series of slides of frogs, lizards, snakes, crabs, millipedes and centipedes, spiders and a wide range of insects. Many of these are larger and more colourful than their British counterparts. Dr Ismay closed his talk with some pictures of the native people in ceremonial dress. These costumes involve the use of large numbers of bird of paradise feathers.

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Contributions must be double-spaced with 3 cm margins either side to facilitate marking up. They should be typed if possible, on one side only of A4 paper. Layout should follow that of the journal, but apart from underlining scientific names, no marks should be made to define typeface.

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BRITISH ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY

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Cover illustration: Black Darter, *Sympetrum danae* (Sulzer). Photo: R. Williams.

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BREEDING *EUDRYAS AURINIA* ROTT. AB. *VIRGATA* TUTT

RUPERT BARRINGTON

101 Egerton Road, Bishopston, Bristol, Avon BS7 8HR.

E. aurinia ab. *virgata* is characterized by having the central row of upperside forewing black spots greatly reduced or absent, leading to the pale markings extending to form a pale median fascia (Porter, 1989). It is a form that probably occurs from time to time in most colonies of this species, although extreme forms are rare. Some colonies, however, have produced well-developed forms on a regular basis. Hod Hill in Dorset was, in the past, one such locality.

In the field transitional forms from type through to extreme *virgata* may be found, which would suggest that this is an example of multifactorial/polygenic variation. In this type of variation 'a number of different genes may have similar effects and, should they act cumulatively, they may give rise to a graded series of varieties in which distinct segregation cannot be recognised' (Ford, 1945). This is as opposed to recessive, dominant or semidominant aberrations in which a single mutant gene is responsible for the variation, and will, when bred, 'produce two or three clear cut classes' (Berry, 1977) of aberrations in the subsequent generations.

It appears that the terms 'multifactorial' and 'polygenic' (and hence 'single-factor' and 'monogenic' when discussing single mutant genes) are synonymous, as various authors have used one or the other to describe the same phenomenon. Multifactorial is used by Ford (1945) and Berry (1977), whereas Ford (1964), Robinson (1971) and Robinson (1990) use polygenic. Kettlewell (1973) uses both as a heading to his paragraph on this form of variation.

In June 1990 a worn male *virgata* was taken in Dorset. This was placed in a cage with a fresh, wild-captured typical female, and a pairing was soon observed. As the male of this species leaves a permanent plug after mating to ensure that the female will not pair again, it was certain that the female had not mated previously. Two batches of eggs were laid and a brood of approximately 120 adults reared the following spring. This contained two male *virgata* (not extreme), and a small number of transitional forms in the male. All females were of the typical form, as were the rest of the males. A pairing was obtained between a transitional male and a typical female. The weather at this time was cold and windy, and the female waited 7 days before pairing. A single batch of eggs was deposited.

In the spring of 1992 about 100 larvae emerged from hibernation, but they were weak, and many more succumbed to disease than is usual in this species. About 50 adults emerged. The whole brood was graded from type to fully developed *virgata* in both sexes (a male is illustrated here). Expecting pairing to be as easily achieved as is usual with *aurinia*, a number of the most extreme adults were placed in breeding cages, but despite continuous warm and sunny weather no pairings were observed and no eggs laid. The brood was weak, with a number of deformed adults and some that were unable to hang onto the netting of the emergence cage for long enough to allow full expansion of the wings.

The graded nature of the brood supports the suggestion, based on fieldwork, that this variation is multifactorial/polygenic, and it clearly has a weakening effect on the aberrant individuals. This is very much in line with the classic study of a colony of *aurinia* near Carlisle over a period of 55 years as described by H. D. and E. B. Ford (1930) and summarized by E. B. Ford (1945). Here variation increased dramatically when the population rose sharply from a period of scarcity, and many of the aberrations were weak or deformed. They described and illustrated an aberration (*virgata*) which appears to have been the most frequent form of variation in this colony.

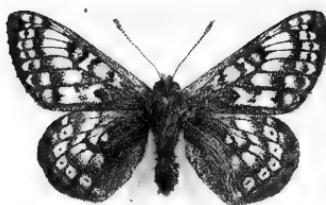


Fig. 1. *Eurodryas aurinia* Rott. ab. *virgata* Tutt ($\times 1.5$ life size).

during a 6-year period of extreme abundance of the species (1894–1899). When the population stabilized aberrations were hard to find. (R. M. Craske (*pers. comm.*) made similar observations during a population explosion of the species near Plaistow, Sussex in 1945/6.) The authors attributed this phenomenon to the fact that weaker, aberrant individuals would have a chance to survive to become adults during a period in which the population was increasing in size from a point far below its average towards its optimum size. This is because, during a period of increasing population size, selection would be less intensive than when the population reached its optimum level.

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SHORT COMMUNICATION

The white-letter hairstreak in south-east London.—One the warm and muggy morning of 17.vii.1994 a large *Buddleja* bush in Nunhead Cemetery, London SE15, attracted only a single butterfly, a rather battered white-letter hairstreak, *Strymonidia w-album* (Knoch). This was the first time I had encountered the species in Nunhead, although a dead hairstreak caterpillar was brought to me, from the cemetery, some years ago. The several hundred large English elms, *Ulmus procera* Salisb., which punctuated the cemetery grounds were killed in the 1970s by Dutch elm disease; many of their trunks still lie prostrate in wooded corners. Suckers and saplings are regenerating; they now reach about 6 m high and the disease is reappearing to kill a few each year. The butterfly is obviously very local in the London area, but its appearance in Nunhead (vice-county 17, “Surrey”) may support ideas that it is recolonizing as elms regrow.—Richard A. Jones, 13 Bellwood Road, Nunhead, London SE15 3DE.

SEPARATION OF SOME *ERISTALIS* SPECIES USING ABDOMINAL COLOUR PATTERN

GRAHAM J. HOLLOWAY

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Some sets of hoverfly species are rather difficult or laborious to separate in the field (e.g. *Baccha* spp., *Paragus* spp., *Sphaerophoria* spp.) and collectors often decide to capture a few to identify them later on with the aid of a microscope. When all species concerned are interesting for one reason or another this poses no real problem, but occasionally a rare or scarce hoverfly resembles a particularly abundant species. In this situation many records of the less common species may be completely overlooked and, consequently, an accurate picture of their distribution and abundance may take a very long time to emerge. Any studies on long-term population changes in a species such as this would have little value given the unreliability of past distribution and abundance estimates.

Stubbs and Falk (1983) describe *Eristalis abusivus* Collin as a "local" species but "the commonest *Eristalis* in some coastal districts". The separation of *E. abusivus* from the closely related *E. arbustorum* (L.) is relatively straightforward, but requires inspection of the fine structure of the arista. Other characters that can be used include the distance over which the eyes touch in the males (van der Goot, 1981) and the amount of yellow on the tibia of the middle leg. Apart from perhaps the eye character in the males, none of them are very accessible to use in the field. However, the biggest problem is that similar species, such as *E. arbustorum* and *E. nemorum* (L.), are so abundant and widespread. In a mass of *Eristalis* species, not many entomologists would be prepared to devote time to checking hundreds of individuals on the chance that a few *E. abusivus* are present. Stubbs and Falk (1983) also consider it likely that this species is overlooked in the field.

Recently, I carried out a study of colour variation in certain *Eristalis* species using museum specimens held at the Natuurhistorische Museum in Leiden, The Netherlands (Holloway, 1993). The sample sizes were large and for *E. arbustorum*, *E. abusivus* and *E. nemorum* 3169, 843 and 826 individuals were inspected, respectively. Using these specimens, I was able to ascertain not only the amount of pattern variation shown, but also any consistent pattern differences among the species (Figure 1). Although this type of quantitative variation is not generally considered useful to identify species, I found, in the course of my study, that I was able to identify many individuals immediately solely on the basis of their colour pattern. A couple of *E. arbustorum* that had somehow crept into the *E. abusivus* boxes stuck out like sore thumbs! It occurred to me that colour pattern differences may be a quick and easy way of provisionally assessing in the field the occurrence of *E. abusivus*. Having captured a likely looking candidate, the accepted qualitative characters could then be used to confirm identification.

There was always a considerable difference between the sexes in all species with most of the variation in females occurring on tergite 2 and in males on tergite 3. There were a number of important consistent differences between the colour patterns of *E. arbustorum* and *E. abusivus*. In *E. abusivus*, the yellow patches on the abdomen never touched the trailing edge of tergite 2 in females and tergite 3 in males. In *E. arbustorum*, the trailing edges of these tergites were often reached by the yellow patches. In female *E. abusivus*, the yellow patches on tergite 2 when present assumed a hooked shape, whilst in female *E. arbustorum* the yellow patches were more

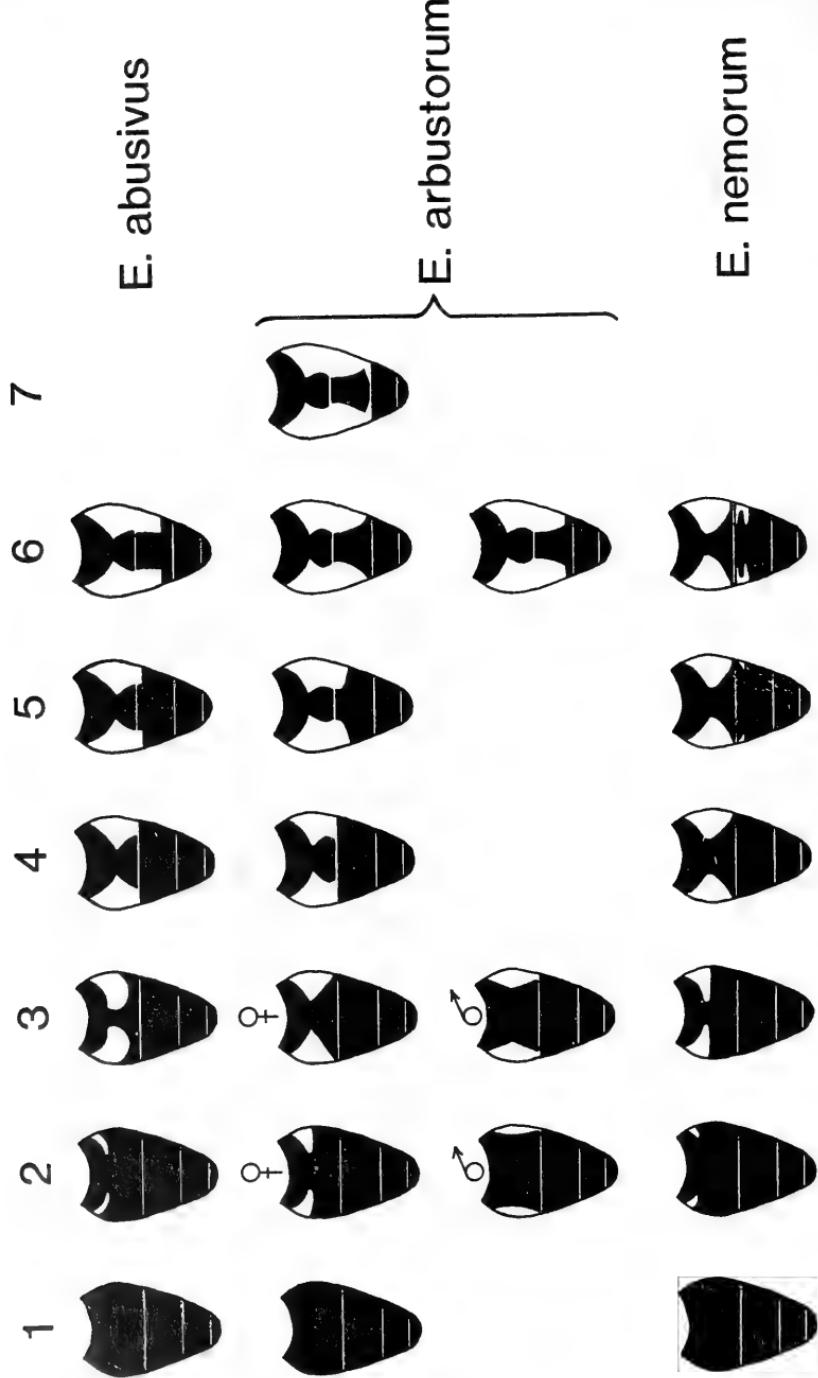


Fig. 1. Scheme used to classify extent of yellowish markings on abdominal tergites in three species of *Eristalis* hoverflies. Range of patterns in *E. arbustorum* placed into category 6 is shown. Categories 2 and 3 differed between the sexes in *E. arbustorum* as indicated.

triangular. In male *E. abusivus*, the yellow patches on tergite 3 were squarish with the vertical inner edge and the bottom edge of the yellow patch forming a 90° angle. In male *E. arbustorum* the inner edge of the yellow patch on tergite 3, more often than not, curved outwards towards the lateral margins of the tergite. Of course, colour pattern could not always be used. For example, the females of both species are sometimes devoid of all paler pigmentation on the abdomen. However, over 60% of female *E. arbustorum* were assigned to the categories 3 and 4 shown in Figure 1 and over 30% of female *E. abusivus* were category 3. All of these insects could be instantly identified without reference to further characters. As for the males, over 85% of *E. abusivus* were of category 6 and over 60% of *E. arbustorum* fell into category 6 or 7. Again, all of these individuals were easy to identify. Clear differences also existed between *E. nemorum* and the other two species, as can be seen from Figure 1, which again facilitate separation of *E. abusivus* from *E. nemorum*.

This study was carried out using insects that were collected in The Netherlands. It is likely, although yet to be established, that the range and type of colour variation shown by *E. abusivus* in Britain is the same as found in The Netherlands. If this indeed proves to be the case, then colour pattern differences could be a useful way of screening large numbers of *Eristalis* species quickly and efficiently.

ACKNOWLEDGEMENT

I am very grateful to Dr Peter van Helsdingen for allowing me access to the Syrphidae collection at the Natuurhistorische Museum in Leiden, The Netherlands.

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ANNOUNCEMENT

Librarian needed.—I am leaving this position after the 1995 annual general meeting, having performed this function since 1982. Therefore a replacement person is sought for this post as soon as possible. The main duties are to monitor the members' use of the library using computer methods, purchase new material, monitor existing exchanges of journals and arrange new exchanges with other entomological organizations and manage the organization and shelving of the stock.

The new facilities at Dinton Pastures, combined with the installation of a new computer to use with the society's existing library database make the job of library management somewhat easier than it used to be at our old rooms in South Audley Street. However attendance is required at the new rooms once a month, as a minimum, to open the post, record and shelve incoming items and monitor loans.

Due to ever-increasing work commitments and other considerations I feel I can no longer give as much time to the position as it requires. A full description of the duties of the post are available from me, Stephen Miles, Librarian, 469 Staines Road West, Ashford, Middlesex TW15 2AB, tel: 0784 252274.

BENHS INDOOR MEETINGS

11 January 1994

The President, Dr D. LONSDALE, announced the deaths of Mrs K. Emmet and Mr C. B. Ashby.

Mr R. A. JONES showed three 'bird nest' beetles, *Hister merdarius* Hoffmann, J., (Histeridae), *Quedius ventralis* (Aragon) and *Q. brevicornis* (Thomson, C. G.) (Staphylinidae), collected from Honor Oak, S.E. London, on 7.i.94 from nest material in a hollow tree (probably oak) exposed after wind had torn off a large branch. All three species are regarded as very local or rare and are specifically associated with birds' nests. There was no way of knowing what had made the nest, composed of a mixture of leaves and wood mould, but the presence of two specimens of the flea *Orchopeas howardi howardi* (Baker) suggests that its host the grey squirrel had used the nest fairly recently. Although the grey squirrel must be about the commonest wild mammal in this area, this was the first record of the flea in the 10-km square TQ37. Mr R. S. George kindly identified the flea.

Mr D. HACKETT showed a male specimen of the spring usher moth *Agriopsis leucophaearia* (D. & S.) close to the melanic form *merularia* Weymer. It had been beaten from holly in Queens Wood, north London, on 8.i.94. This appears to be an early date for a moth more usually seen in late February and March.

Mr R. SOFTLY said that he had also taken *A. leucophaearia* recently at light in Hampstead and agreed the first week of January was early for this species.

Mr S. MILES drew the meeting's attention to copies of the Wildlife Link newsletter and Annual Report for 1992, which were made available.

Dr C. GIBSON spoke on the subject of "Insects and habitat restoration". The talk was based largely on the restoration of limestone grassland at Wytham Wood, Oxford. This ancient woodland has a number of grassy clearings which were converted to arable farming but have now been allowed to revert to grassland. Before restoration can be attempted, or its success monitored, it is necessary to know what plants and animals were present in the past. The degree and speed of colonization is largely dependent on how much of the original fauna and flora has survived in uncultivated patches and how close these are to the restored areas. Recolonization has to take place in a sequential manner with plants establishing first before their associated invertebrate faunas can develop. Some insects, however, had arrived in the restored areas at Wytham before their typical food plants were established. It was found that the brown argus and marbled white butterflies had been able to colonize the area by switching to alternative host plants.

It can take 100 years or more for the floral diversity to become indistinguishable from the original grassland, so restoration is inevitably a long-term process. Plant colonization can be crudely divided into three phases. The early colonizers predominate in the first 5–10 years, followed by a second group that flourish after 10–100 years but later decline. The third group does not occur in numbers until the grassland is about 100 years old. Each of these three groups has its own associated insect fauna. Although the early colonizers are mostly common species, in some situations they may include scarce or local insects. At a Center Parcs holiday complex in the Breckland it was found that the grey carpet moth, *Lithostege griseata* (D. & S.) quickly took advantage of the growth of flixweed that grew on disturbed ground. The management plan for the site now includes rotovating strips of land to maintain the habitat requirements of the moth and its host plant.

The insect fauna and plants at Wytham, especially in the grassy areas, have been well documented in the past. Experimental plots have been set out to monitor the return

of plants and invertebrates to the restored areas. The research has four main aims. These are: (1) to update the records for certain selected groups of invertebrates in and around the core experimental areas; (2) to establish suitable sheep grazing regimes; (3) to monitor the distribution and structure of plants on the site; (4) to monitor the distribution and abundance of insects and spiders on the site. The main sampling method for invertebrates is the use of vacuum suction equipment. The target groups of invertebrates selected for the survey are Coleoptera, spiders, leafhoppers and heteropteran bugs, as these are suitable for collection by this means. Leaf miners are also recorded as their feeding activities enable many species to be identified, even if the insects are no longer on the plants. Certain target species of plants and their associated insects have been intensively surveyed to map their arrival and distribution through the plots.

Dr Gibson concluded that the early indications of the survey are that in the right places a great deal can be achieved quite quickly in restoring the habitat, and with a suitable management regime it should, in the long term, be possible to regain something resembling the original ancient grassland.

22 February 1994

Mr R. A. JONES showed a range of specimens of *Mycetophagus piceus* (F.) (Coleoptera: Mycetophagidae) collected under the fungoid bark of an oak stump in Knole Park, Sevenoaks, Kent, on 15.xi.93. The delicate pattern of this species varies from light with darker markings to dark with lighter markings. The range of patterns is aptly summed up by a term one might borrow, or translate, from German authors—Aberrationsspektrum.

Mr Jones also showed a specimen of *M. quadripustulatus* (L.). Typically this species varies very little; it is dark brown or black with four large orange spots on its elytra. However, this specimen, from under the bark of a sycamore tree on Bookham Common, Surrey, found on 13.xi.77, showed a peculiar departure from this. The anterior spot on the left elytron was drawn out behind into a long droplet-shaped appendage, while just in front of the posterior mark on the right elytron was a small supernumerary spot. Whatever process caused the aberrant pattern, its development was controlled independently across each of the beetle's wing-cases.

Mr Jones's third exhibit was of a specimen of a *Philonthus* spp. (Coleoptera: Staphylinidae) attacked by a parasitic entomophagous fungus. The beetle was found dead among grass roots near Hengisbury Head, Bournemouth, Dorset, on 8.viii.93. The unidentified fungus was characterized by long sinuous tendrils extruded between the chitinous plates of the insect's body.

Mr C. W. PLANT showed a specimen of *Hemerobius fenestratus* Tjeder (Neuroptera: Hemerobiidae). This lacewing was added to the British list by the exhibitor when he took a male during a BENHS field meeting at Etchden Wood, East Kent, in 1986. This was the only British record until the exhibited specimen, a female, was taken in a Rothamsted light trap by Geoff Burton in his garden at the Isle of Sheppey, East Kent, between 30.vii and 5.viii.92. It is closely related to *H. pini* Steph. and *H. contumax* Tjeder, all three originally being regarded as a single species. It can, however, be distinguished in the field by the lack of dark shadowing on the outer series of gradate cross-veins in the forewings and the transparent forewing patch anterior to the cubital vein, from which the specific epithet *fenestratus* is derived.

Mr A. J. HALSTEAD showed an undersized male *Platystoma seminationis* (L.) (Diptera: Platystomatidae). It had a wing span of 8.5 mm and body length of 4 mm, compared with the more usual 12 mm wingspan and 6 mm body length. A typical male

and female were shown for comparison. All three specimens were swept from chalk grassland at the BENHS field meeting at Therfield Heath, Royston, Herts, on 29.v.93. The larval stage of this fly has been recorded as feeding in a fungus, *Tricholomopsis rutilans*.

The following persons have been elected as members: Neil Arnold, James Brock, Paul A. Boswell, Wolfgang Billen, Gareth King, Graeme P. Smith and Malcolm Cotterill.

Mr R. D. HAWKINS reminded members that the Society's hoverfly book had been reprinted and was available again.

Dr P. WARING described his experiences with two overwintering goat moth larvae, about 7 cm long, that he is rearing. These are recorded in the literature as making a cocoon in which they overwinter and then sometimes making another in the spring in which they pupate. He was keeping the larvae indoors at 50–60°F in plastic boxes with some soil and with brown bread and half apples as food. From time to time the food material needs replacing as it becomes mouldy. Each time when the larvae have been disturbed they have remade a loose, coarse cocoon for themselves. They have continued to feed intermittently at about 2- to 3-week intervals. One larva had moulted just after the New Year. A head capsule was found although there was no sign of the cast skin.

The ordinary meeting was closed and was then followed by the Annual General Meeting.

Minutes of the Annual General Meeting of the Society held at the rooms of the Royal Entomological Society of London at 6.30 pm, 22 February 1994. Chairman: The President, Dr D. Lonsdale. Present: 33 members.

Minutes of the last Annual General Meeting were read and signed.

The Secretary read the Council's report, followed by the Treasurer who read his report. The Treasurer then invited questions on his report but there were none. The Editor, Librarian and Curator then read their reports and Dr M. J. Scoble read the report of the Hering Memorial Fund. The President proposed the adoption of the reports; this was seconded by Dr I. F. G. McLean and passed unopposed.

The President then read the names of the Officers and Members of Council recommended by the Council for 1994–95 and, as no other names had been submitted, he declared the following duly elected. President: Dr P. Waring; Vice-Presidents: Dr D. Lonsdale, Dr M. J. Scoble; Treasurer: A. J. Pickles; Secretary: R. F. McCormick; Editor: R. A. Jones; Curator: P. J. Chandler; Librarian: S. R. Miles; Lanternist: M. J. Simmons; Building Manager: P. J. Baker; Ordinary Members of the Council: B. R. Baker, J. R. Dobson, A. J. Halstead, C. Penney, S. C. Pittis, J. Muggleton, I. F. G. McLean, G. A. Collins, D. Young and R. K. Merrifield.

The Secretary then read Bye-law 26(d) and invited motions or questions. Mr R. Softly asked about the vacant Trustee position. Mr Pickles said that Rev. D. Agassiz had agreed to become a Trustee of the Society.

The President then read his report and gave his address.

The President then installed the new President, Dr P. Waring.

The President proposed a vote of thanks to the retiring President, and this was seconded by Mr D. Young. The President asked for permission to publish the Presidential address, and this was given.

Rev. D. Agassiz gave a vote of thanks to the retiring Officers and Council.

Auditors: The President proposed the election of Mr R. A. Bell and Col. D. H. Sterling as Auditors for the coming year with Council being empowered to appoint registered auditors under the Charities Act if necessary. This was seconded by Mr C. Plant and Mr R. Softly and passed unopposed.

8 March 1994

The President, Dr P. WARING, showed a cocoon of the striped lychnis moth, *Cucullia lychnitis* Ramb. (Lepidoptera: Noctuidae). He had collected larvae in 1991 and, although some adults had emerged in 1992, a greater number were produced in 1993. Delayed emergence is well known in this species. The larvae prefer to feed on the flower spikes of *Verbascum nigrum* L., which is a biennial or short-lived perennial plant. The extended adult emergence may help the species survive years when flowering plants are scarce.

Miss L. FARRELL circulated a copy of a newsletter on Shetland Lepidoptera produced by a newly formed entomology group in the islands.

Mr R. SOFTLY showed two colour transparencies of larvae of the belted beauty moth *Lycia zonaria* (Harrison) (Lepidoptera: Geometridae) found feeding in an area of machair grassland on Iona in mid-June 1990.

The following persons have been elected as members: Paul R. Mabbot, John Arthur Thompson, David Graham Hemingway, John Leslie Dyer, Robin Williams, Roger Guy Gaunt, Roland Humphreyes, Edward Lawrence Bee and John Szczur.

Mr A. J. HALSTEAD and Dr Waring reminded members of the forthcoming workshops to be held at Dinton Pastures. The clearwing meeting on 23 April would be followed by light trapping in the evening.

Miss Lynne Farrell spoke on "Wild flowers in the Highlands and Islands of Scotland". The lecture took the form of a journey through some of the prime botanical sites in Scotland, starting in Angus and going through Ben Lawers, Mull, the Treshnish Isles, Skye, Orkney and Shetland. Many of the alpine plants shown have a very restricted distribution and are at risk from overgrazing, plant collectors and, in some cases, dry summers. Miss Farrell described some of the work she has done to assess the population sizes and distribution of some of the rarer plants. Quadrats and transects are used to assess plant density and photographic records are kept of the size of colonies. Similar measurements in subsequent years indicate any changes in the plants' status and provide an indication of the success or otherwise of the site's management regime.

The lecture was not without entomological interest. Slides were shown of the burnet moths *Zygaena loti* (Rowland-Brown) and *Z. purpuralis* Tremewan on Mull, the scarce chrysomelid beetle *Chrysolina crassicornis* (Hellie.) on Skye, the bumble bee *Bombus muscorum* (L.), the hoverfly *Sericomyia silentis* (Harris) and local forms of the red carpet and ghost swift moth on Shetland.

In recent years the waters around Shetland have become busy with shipping due to the oil industry and the increase in fish processing vessels. The poor condition of some of the latter, coupled with the severe weather encountered in the area, result in shipwrecks which can have a major impact on wildlife. The speaker showed slides of several wrecks, including the oil tanker *Braer*. The oil spillage from the tanker seems to have had little lasting effect on the higher plants on Shetland but mosses and lichens have been killed by oil blown onto the land.

12 April 1994

The President, Dr P. WARING, showed some distribution maps for Great Britain of moths based on post-1980 records which update maps given in *The butterflies and moths of Great Britain and Ireland*. The maps indicated the changing status of some moths. The oak tree pug appears to be more widespread than before 1980 but this probably reflects improved recording and it is no longer classified as notable. The sloe pug, which was new to Britain in the 1970s, is now known to be widespread. The

obscure wainscot is expanding its range, especially in Yorks. and Lincs. The satin lutestring is common in the Weald of Kent and occurs in pockets along the west coast but remains a nationally uncommon species. Dr Waring referred to the need to have a regionally notable classification. He also circulated a map indicating "hot spots" where scarce macrolepidoptera requiring further recording and research occur.

Mr R. A. JONES showed specimens of *Calopteron discrepans* (Newm.) and *C. terminale* (Say) (Coleoptera: Lycidae) and a large unidentified ichneumon species, all from tropical oak woodland in central Florida, USA, in March 1994. Beetles of the family Lycidae (net-winged beetles) are said to be distasteful to predators. Most are brightly and warningly coloured red and black. Various other insects are said to mimic them, including several black and red arctiid moths. Despite the obvious differences between the set specimens of beetles and ichneumons, there exists a remarkable similarity when observed on the wing. The Florida sunlight is strong and harsh, and even in the dappled undergrowth, motes of light are bright and piercing. The dark body and wings of the ichneumon contrast with the extremely pale antennae which are held straight out sideways in flight. The pale flash of these antennae, seen when the insect flies through a spot of light, resembles the lycid elytra, also held straight out in flight. The resemblance, at least to the human eye, was quite startling.

Mr Jones also showed some slides of what were thought to be fungus gnat larvae (Diptera: Mycetophilidae), found under a fungoid oak log in Nunhead Cemetery, 9.iii.1994. The vermiform (worm-shaped) larvae were contained in tubules of slime, through which they moved back and forth. Associated with them were several flexible and mucilaginous cocoon-shaped structures also exhibited, though now dry and crisp. These were thought to be either larval retreats or pupal cocoons.

Mr P. CHANDLER suggested that the larvae might be those of the mycetophilid subfamily Keroplatinae.

Mr R. UFFEN showed a live specimen of a solitary bee *Andrena chrysosceles* (Kirby) which had a female *Stylops* sp. (Strepsiptera: Stylopidae) protruding between the fourth and fifth tergites. A live male *Stylops hammella* Perkins swept from the same bee colony at Datchworth, Herts, was also shown.

Mr R. SOFTLY showed a live tawny pinion moth, *Lithophane semibrunnea* (Haw.) (Lepidoptera: Noctuidae) taken in a light trap in his garden in Hampstead. This is a very local species in the London area although it does appear to have become more frequent in recent years; 1992 was a record year with 13 being recorded in the trap. Mr Softly noted that despite this moth emerging in the autumn and overwintering, all of his records were of moths in the spring. He also displayed some publicity brochures about books on African butterflies and Australian insects.

Mr A. J. HALSTEAD showed a male sawfly, *Nematus myosotidis* (F.) (Hymenoptera: Tenthredinidae) taken in the Middle Marsh area of Dinton Pastures Country Park, Berks., 27.vi.93. This specimen, of a common species, was noteworthy for its aberrant antennae. Both had a small but distinct spur on the underside of the fifth segment; normally the filiform antennae have no adornments.

The President said that Mr Roger Morris, the Field Meetings Secretary, wished to give up this post. A replacement is needed, preferably before the Annual Exhibition, which is a good opportunity to line up leaders for the following year's programme of meetings. He also reminded the meeting of the special meeting, to be held during the ordinary meeting of 10 May, which would appoint a new trustee and amend the constitution.

The President reported that he had found a common pug, *Eupithecia vulgata* (Haw.) on his house. This appears to be an early emergence.

Mr Halstead reported that the sawfly workshop held at Dinton Pastures on 19 March had been very successful with 18 persons attending.

Dr SIMON LEATHER spoke on insects on bird cherry (*Prunus padus* L.). The bird cherry is a native British tree mainly found growing naturally in northern Britain. It has 28 species of insect associated with it, including three added by the speaker during the course of his studies. This compares with 153 species associated with *Prunus spinosa* L., 67 species with *Prunus domestica* L. and 40 species with *Prunus avium* (L.) L. It would appear that *P. padus* and *P. avium* are under-represented in terms of associated insects in Britain.

Dr Leather gave some details of the leaf beetle *Phytodecta pallida* (L.). This polyphagous chrysomelid beetle is one of the species that Dr Leather added to the bird cherry's insect list. At his main study site at Roslin Glen near Edinburgh, adults emerge in March and lay eggs in April. Larvae are present from April to June and pupate in July. Adults emerge in July but later return to the soil where they overwinter. The adults and larvae eat holes in the leaves.

The main part of the talk concerned the bird cherry aphid, *Rhopalosiphum padi* (L.), the bird cherry small ermine moth, *Yponomeuta evonymella* (L.) and their inter-relationships. The former overwinters on bird cherry as eggs which are often placed in bud axils. They hatch at bud-burst and give rise to several generations of wingless female aphids that cause a downward rolling of the leaf margins. In early summer winged females develop and migrate to cereals and other grasses. In late summer and autumn there is a return migration of winged males and females. In mild areas the aphid can persist on grasses all the year round. Numbers of the aphid on bird cherry vary from year to year. The date of arrival of aphids on the tree at the end of summer varies from August to September with the majority arriving in October. The overwintering mortality of eggs is about 70–80% regardless of numbers laid. Eggs placed in the favoured position between the buds and stem are more likely to survive than those placed in more exposed positions. Counts of eggs during the winter are being used as a means of warning farmers of potentially bad bird cherry aphid years when cereal crop spraying will be necessary. Heavy infestations on bird cherry in the spring can cause the shoot tips to die back and more than ten aphids per leaf can cause no fruits on the tree. This damage also changes the physiology of the plant with the shoots developing with buds more closely adpressed to the stems which have shorter internodes between the buds. Such shoots provide better egg-laying sites for the aphid later in the year. Roadside trees were noted as being more heavily infested than those in woods, and they also had a lower winter egg mortality, possibly as a result of fewer predators being on roadside trees.

The small ermine moth lays batches of 50–100 eggs on young shoots in August. These hatch and overwinter as first instar larvae under the protective shield formed by the egg mass. The caterpillars become active in the spring and begin webbing the foliage. By mid-summer they may have caused severe defoliation and covered the tree in spectacular swathes of white silk. Woodland trees are generally more heavily infested than exposed trees, possibly because the weak-flying adults need shelter. Counting the number of overwintering egg shields gives a good correlation with the degree of summer defoliation.

A negative correlation was noted between numbers of bird cherry aphid eggs and the egg shields of the moth. In experiments with trees artificially defoliated to varying degrees it was found that fewer aphid eggs were laid on the more severely defoliated shoots. This effect on 2-year-old trees was still apparent up to 5 years later. When small ermine moths naturally invaded the experimental plot, the heavily defoliated plants were targeted as egg laying sites. The shoots on these plants have more widely spaced buds which are less closely adpressed, which creates more space for the moths to lay. This research shows that the aphid and moth are in competition for egg laying sites and both insects are capable of altering the host plant's growth pattern to their own advantage.

10 May 1994

The President, Dr P. WARING announced the deaths of Dr Basil MacNulty and Mr Gaston Prior. Both were former presidents of the society.

Mr R. A. JONES showed a dwarf specimen of the common leaf-rolling weevil *Apoderus coryli* (L.) taken by sweeping in Hoe Copse, Midhurst, West Sussex, 18.vi.1978. The species is known to vary somewhat in size and is usually quoted as being 5.9–8.0 mm long. At 5.3 mm the specimen fell well outside this range.

He also showed a specimen of the seven-spot ladybird, *Coccinella septempunctata* (L.), taken near Dade City, central Florida, USA, on 21.iii.1994. This Eurasian species was first released in the USA in 1956. Over the next 15 years it was introduced in several Atlantic and mid-western states, but establishment was not confirmed at any of the release sites. The first confirmed records of permanent establishment in North America were in New Jersey and Quebec in 1973. By 1988 the beetle was recorded from 39 states and it continues to spread westwards.

Dr P. WARING showed a larva of the goat moth, *Cossus cossus* (L.), that he had been rearing. It was unusually small and pale in colour, and may be parasitized. While replacing the food material in the rearing box, Dr Waring had discovered a tipulid larva in the caterpillar's feeding gallery in the apple. It had presumably been introduced with soil placed in the bottom of the rearing box.

Mr A. J. HALSTEAD showed a live specimen of *Trox scaber* (L.) (Coleoptera: Trogidae) collected in his garden at Knaphill, Surrey. E. B. Britton in the RESL handbook on Scarabaeidae (1956), described *T. scaber* as occurring "in dry animal remains, wood mould in oaks and elms, and birds' nests". L. Jessop in the 1986 revision of this work describes it as occurring "in birds' nests in hollow trees (mostly owls' and other nests containing bones) and in detritus of animal origin". It also occurs on the inside of the exhibitor's compost bin, where there are no nests or bones. It seems likely that this beetle has much less specialized requirements than has been suggested and it can probably breed in a wide range of decaying organic materials.

Mr R. D. HAWKINS showed a live specimen of the shield bug *Eurygaster testudinaria* (Geoffroy) (Hemiptera: Scutelleridae) found 10.v.94 on a roadside verge at Horley, Surrey. The specimen had a purplish-red colour, unlike the brown colour typically shown by adults in the autumn.

The following persons have been elected as members: John Edmund Chainey, Simon James Hayhow, Martin Cade, David John Poynont, Toby Howes, Jacqueline Shane, Martin Evans, Derek Harry Howton, Beatrice Gillam and Jonathan Paul Guest.

The scheduled speaker was replaced by Dr Jonathon Denton, who spoke on the natterjack toad and its conservation. The natterjack toad is Britain's rarest amphibian and it has gone from most of the inland sites where it was found earlier in the century. Apart from one heathland site on the Surrey/Hampshire border, it is now confined to coastal sites in East Anglia, north-west England and the Solway Firth. The habitats in these various sites—heathland, mobile sand dunes and salt marsh—are seemingly very different but a common feature is the availability of open ground with sparse vegetation. Natterjacks have good long-distance vision and run after prey, unlike the more sedentary common toad.

During the mating season the males position themselves at the edge of pools and make loud calls that can be heard a mile away at night. After pairing the females lay 2–5000 eggs in warm shallow pools. The tadpole stage lasts 6–8 weeks. The small toadlets remain near the pool and are diurnal for the first month after metamorphosis. Later they become nocturnal and after 6–8 weeks are large enough to be able to make burrows in the ground to avoid desiccation.

Dr Denton described his studies of the natterjack at its heathland site at Woolmer Forest. It prefers the open bryophyte dominated areas, unlike the sand lizard and smooth snake, which are found in the mature heather areas. Suitable ponds have been created to increase the breeding sites, and trees and shrubs have been cleared to enhance the habitat for the toads. It has been found that not all females spawn. In the years 1988–92 the numbers of females recorded varied from 65 to 76 and of these only 34 to 49 produced spawn (44–64% of the female population). This may be due to a shortage of males, since the number of spawn strings produced is directly proportional to the number of males calling. Female natterjacks live for 10–15 years but males do not seem to survive more than 7. This may be due to differential predation by grass snakes. Males are more active at the pond margins during the mating season and may be at greater risk. Increased grazing to reduce the poolside vegetation and remove cover for snakes is being tried to see if this increases the breeding success of the toads.

The natterjack toad is one of the species benefiting from English Nature's species recovery programme. Sites suitable for reintroduction have been identified in Surrey, Dorset, Lincolnshire and Norfolk. The first introductions three years ago in Dorset and Lincolnshire have now produced breeding colonies.

The pools at Woolmer Forest are also notable as being the only British site for the dytiscid beetle *Graphoderus zonatus* (Hoppe). It is also found in Germany and Scandinavia. Little is known about its biology and Dr Denton is attempting to breed it in captivity.

The ordinary meeting was followed by a special meeting to appoint a trustee and to make some amendments to the society's bye-laws.

Minutes of the special meeting

The President, Dr P. WARING, said that it was necessary to appoint a trustee to replace the late Mr C. B. Ashby. He explained that although recent changes in the law relating to charities make all of the society's council members trustees, it is still necessary to have two named persons as "trustees" to be signatories for the society's assets. The person nominated by council as trustee was the Rev. Canon D. Agassiz. The voting, including postal votes, was 56 in favour, none against and one abstention. The Rev. Canon D. Agassiz was duly elected as trustee.

The meeting was also asked to make some changes to the society's bye-laws. These were to delete clauses 4(i) and 32(c), and to change clause 11(a) to "not exceed twelve at any time". The proposed changes will remove the power from the society to pay insurance premiums in order to insure against personal liabilities which may be incurred by its charitable trustees (members of council). This is in accordance with advice received from the Charity Commissioners. The third change, clause 11(a), will increase the number of honorary members to 12 at any one time. The voting, including postal votes, was 56 for and one against. The amendments to the bye-laws were therefore agreed.

ANNOUNCEMENT

Dead caterpillars wanted.—We would be very grateful for any lepidopteran larvae of UK origin killed by baculovirus infection. This is often characterized by whitening, followed by complete liquefaction of the larva, which can then often be found hanging from a prominent position on the foodplant. Samples should be frozen for storage and sent to: Mr Martin C. Townsend, Ecology Group, NERC Institute of Virology & Environmental Microbiology, Mansfield Road, Oxford OX1 3SR, tel: 0865 512361.

OFFICERS' REPORTS FOR 1993

COUNCIL'S REPORT

The Society's membership stood at 704 at the end of the year, a small increase on the numbers for the previous year. Forty-five new members were elected during the year, 17 were struck off for non-payment and 21 members resigned. Ten deaths were reported to the Society during 1993.

Special thanks are extended by all the Council members to Mr Geoff Burton for the work that he has done for the Society over the past 10 years. Mr Burton is, until a replacement can be shown the ropes, our Assistant Treasurer and he now wishes to resign as he feels that he has done his bit for the Society. We all wish him well and again thank him for doing such stalwart work for us.

The Council met eight times during 1993 and, on average, 15 members attended each meeting. Much of the Council's time was taken up in discussing Dinton Pastures, (the Pelham-Clinton building). There are ongoing problems with the air conditioning and alarm systems. The two Council members who have taken on the brunt of attending for engineers' visits have been our hard-working Curator, Mr Peter Chandler, and our designate Building Manager Mr Peter Baker. Our thanks go to these hard working members and to the other members who have helped with this work. Other items that have taken up the Council's time included the new Charities Act which has needed careful discussion in order to make changes to the Bye-Laws. A special meeting for this was held in September. Another time-consuming topic was consideration of J.C.C.B.I. and related environmental issues.

The Pelham-Clinton building was officially opened on 27 June 1993, by Professor Sir Richard Southwood and was well attended. A buffet was prepared in the Loddon Room and the people who came enjoyed a sunny outdoor feast. Open days have been arranged on a fortnightly basis and have attracted good numbers of members each time. In addition a series of five workshops has been arranged by Dr I. F. G. McLean and these have attracted between 15 and 20 people to each meeting. Our thanks, again, go to the hard working members of Council who are making our new premises a resounding success.

The Society continued to represent members' interests in the field of conservation and Mrs F. M. Murphy and Mr S. R. Miles take an active part as the Society's representatives on the Joint Committee for Conservation of British Invertebrates. The Society continues to subscribe to *Wildlife Link*.

There were 10 indoor meetings, held at the Royal Entomological Society rooms, and a joint meeting with the London Natural History Society which was held at the rooms of The Linnean Society in Burlington House, Piccadilly. In general, attendance at indoor meetings was improved with around 20 people attending each time; this is probably because of the hard work put in by our Indoor Meeting Secretary, Dr McLean, in arranging speakers for these events. The increased interest of the membership in these organized events makes it more rewarding for the Council members involved. A full programme of events is being prepared for 1994/95.

Fourteen field meetings were held in wide-ranging areas of the countryside, including two at Dinton Pastures Country Park; this is part of an ongoing effort to establish what species are living in our own back yard. Attendance at these was low and Mr Roger Morris would like more members to attend field meetings since, more often than not, a great deal of effort has been made to obtain permission to get onto some sites, and since the leaders of these meetings have made the effort to volunteer in the first

place. Mr Morris would also like more members to put their names forward to lead future field meetings.

A successful Annual Exhibition was organized by Mr Michael Simmons; it was attended by 200 members and 70 visitors, around the same numbers as attended the previous year. There were around 175 exhibits with the usual slant on the Lepidoptera but with a welcome increase in the "other" orders. The Council introduced new guidelines to stop controversial exhibits from being shown at the Exhibition. The aim is to stop long series of any species from one locality, unless for a specialized reason, from being shown. Dr Basil MacNulty again organized the Annual Dinner with his customary skill, and the event was considered a success with 40 members and companions sitting down to a meal that was enjoyed by all. This item is still on the agenda for discussion at this year's meetings of the Council.

TREASURER'S REPORT

This last year has seen the final payments for building and equipping Dinton Pastures which has enabled reorganization of our finances onto what hopefully will be a stable basis for the future.

The plans to end the distinction between "London" and "country" members announced last year have come into effect and this necessitated changing our bye-laws. We took the opportunity of a change in subscription rate to introduce covenanted subscriptions which will be held at the current level for 4 years. Initial response is good with about a quarter of our membership having taken this option. The Society will benefit by some £500 a year in reclaimed tax. The suggestion to covenant was first mooted some 30 years ago, I believe, but it is only now after a relaxation in the views of the authorities and protracted negotiation with the Inland Revenue that we have been able to proceed.

The Charities Acts lay a duty of stewardship on Council and it was with this in mind that a firm of financial consultants, Edward J. Mercy and Co. Limited were consulted about our investments. Their proposals, to move the bulk of our cash deposits to investment bonds, set up to comply with the requirements of the Trustees Act, were put into effect just before the year end. We look forward to seeing the benefits of this in the future as interest rates on deposits have fallen to such a low ebb. I am also pleased to say that our consultants have donated some £1160 to us from commission earned on these transactions.

The income and expenditure account shows that our income has fallen by over half following the reduction in interest received, as a result of both lower rates and lower deposits, and the more normal level of donations received. The cost of running the Society has been £13 751 and £6275 for producing the journal. This has been financed by the expected £8000 subscription income with the balance coming from investment income, including £5367 from the bequest fund. The budget for 1994 does not envisage major changes from this level of activity.

The balance sheet shows that Dinton Pastures and its equipping reached a final cost of £154 736 and that this is being written off over the term of the lease at £2210 a year. The total asset value of the Society is almost unchanged at £352 743. Additionally there is an unrealized surplus on investment values of approximately £40 000.

The new accounting requirements for charities which were expected this year, have not yet materialized. However the accounts comply with current best practice and forecasts of what the act is expected to contain.

Colonel Sterling and Mr Bell have once again audited our books and I extend my own and Council's thanks to them.

Balance sheet as at 31st December 1993

	1993	1992
<i>Capital employed</i>		
<i>General fund</i>		
Opening balance	39589	37978
Transfer from bequest fund	5367	-
Transfer from income and expenditure account	<u>(5367)</u>	<u>1610</u>
	39589	39588
<i>Housing fund</i>		
Contributions from other funds	10304	142123
Amortization	<u>(2210)</u>	<u>-</u>
	152526	144431
<i>Special publications fund</i>		
Opening balance	28515	26884
Surplus from sales	<u>980</u>	<u>1631</u>
	29495	28515
<i>Bequest fund</i>		
Opening balance	136411	250217
Income	6451	17357
Grants & expenditure	<u>(16671)</u>	<u>(131163)</u>
	126191	136411
<i>Hering memorial fund</i>		
Opening balance	4878	4999
Income	564	659
Expenditure	<u>(500)</u>	<u>(780)</u>
	4942	4878
	352743	353823
<i>Employment of capital</i>		
Leasehold property	144432	5964
Additions	10304	138467
Amortization	<u>(2210)</u>	<u>-</u>
	152526	144431
<i>Quoted investments</i>		
General fund	28036	32077
Hering fund	3540	3540
Investment bonds	139000	-
<i>Current assets</i>		
Special publications	9088	4000
Christmas cards	289	300
Sundry debtors and payments in advance	3591	1211
National savings investment account	-	63131
Sterling money market deposit	-	80000
Business reserve deposit	11327	17693
Bank current account	<u>8070</u>	<u>9825</u>
	32365	176160
<i>Current liabilities</i>		
Sundry creditors and accrued expenses	2724	2385
	<u>(2724)</u>	<u>(2385)</u>
<i>Net current assets</i>	29641	173775
	352743	353823

Income and expenditure account year to 31st December 1993

	1993	1992
<i>General account</i>		
Subscriptions	7990	7907
Interest and dividends	11512	24545
Redemption surplus	57	-
Donations and bequests	1330	12507
Surplus on Christmas cards	85	79
Surplus on cabinets and collections	700	-
Surplus on dinners	-	7
Total income	<u>(21674)</u>	<u>(45045)</u>
Headquarters services	3687	486
Rent and insurance	692	2344
Headquarters security and maintenance	1348	677
Council rooms and expenses	1699	1009
Members' meetings and exhibitions	1503	1759
Administration	1512	1096
Library	1165	136
Donation to R.S.P.B.	250	-
Subscriptions and donations to other societies	340	208
Grants towards publications	1000	-
Moving expenses	-	1379
Honorariums	350	-
Cost of dinner	205	-
Cost of running society	<u>13751</u>	<u>9094</u>
	<u>(7923)</u>	<u>(35951)</u>
<i>Publications account (free to members)</i>		
Sales	(1344)	(1339)
Bequest fund grant for plates	(1000)	(1039)
Production of journal	6775	5493
Distribution costs	1844	1210
Net cost of journal	<u>6275</u>	<u>4325</u>
Surplus on membership	<u>(1648)</u>	<u>(31626)</u>
<i>Special publications (for sale)</i>		
Sales	(1786)	(3153)
Opening stock	4000	5074
Publication costs	5532	-
Distribution and general costs	362	448
Closing stock	(9088)	(4000)
Net surplus on special publications	<u>(980)</u>	<u>(1631)</u>
	<u>(2628)</u>	<u>(33257)</u>
Surplus to Hering fund	564	659
Surplus to bequest fund	6451	17357
Deficit on general fund	(5367)	1610
Surplus to special publications fund	980	1631
Transfer to housing fund	-	12000
	<u>2628</u>	<u>33257</u>

Notes to the accounts year to 31st December 1993

Accounting policies

- (a) The accounts are prepared under the historical cost convention.
- (b) The costs of building and equipping leasehold premises at Dinton Pastures Country Park have been capitalized. The total cost of these premises which were completed during the year to 31st December 1993 are being amortized over the term of the lease. The first amortization charge was made in 1993.
- (c) The value of the library, collections, ties, back numbers of proceedings and journals and the computer system is not included in these accounts. Current expenditure on such items is written off to the income and expenditure account.
- (d) Donations and legacies are brought into account when they are received by the society.
- (e) Surpluses (or deficits) arising on the special publications fund which accounts for publications primarily for sale are transferred to that fund to finance future publications.

Investments

		Book value at cost	Market value
		General & bequest	Hering memorial
1230	Shell T&T 25p Ord.	477.79	771.83
750	Unilever 5p Ord.	248.45	9322
6270	M&G Charifund Units	19091.17	1147.24
2450.90	Treas. 9½% 1999	771.22	1621.21
3863.71	Treas. 8¾% 1997	3687.94	4087
3882.90	Treas. 9% 1994	3759.57	4038
		<u>28036.14</u>	<u>3540.28</u>
			<u>76489</u>
Investment bonds		Total	
Hendersons		58000.00	
Sun Life		56000.00	
Barings		25000.00	
		<u>139000.00</u>	

Fund movements

The housing fund representing the cost of the Dinton Pastures building has been augmented by a further transfer from the bequest fund. A grant has also been made from the bequest fund towards the cost of colour plates shown in the publications account and towards the general running of the society.

Report of the auditors to the members

We have examined the financial statements attached which have been prepared in accordance with the recommendations of SORP2.

We have audited the financial statements annexed in accordance with approved auditing standards.

In our opinion the financial statements which have been prepared under the historical cost convention give a true and fair view of the state of the Society's affairs at 31st December 1993 and of its income and expenditure for the year then ended.

Col. D. H. Sterling
R. A. Bell

PROFESSOR HERING MEMORIAL RESEARCH FUND

The committee agreed to support two applications to the Hering Fund for 1994, both involving studies of Tephritidae. Dr Alan Gange (Royal Holloway College, London) was granted the sum of £325 towards the costs of a project on the role of nitrogen in the nutrition of the thistle stem gall fly (*Urophora cardui*), an insect associated with *Cirsium arvense*. This study will assess the importance of nitrogen to the fly when nitrogen levels in galls on the thistle are manipulated.

Michael Bonsall (Imperial College of Science, Technology and Medicine) was awarded £175 for work on parasitoid complexes of thistle Tephritidae. His study will include a critical review of the literature on tephritids and their associated parasitoids and the construction of a quantitative food web describing parasitoid associations. Mr Bonsall's project will require the collection of flowerheads and galls from various sites in the UK and the work will involve identification of the emerging insects.

I have received reports on the results of work from three of the projects supported by the Hering Fund last year. In his study of aspects of the behavioural ecology of members of the gracillariid genus *Phyllonorycter*, Dr Vincas Buda (Institute of Ecology, Vilnius, Lithuania) found, amongst other things, that gravid females of the lepidopteran leaf miner *P. ulmifoliella* seem able to distinguish between the leaf of a hostplant with an egg already laid by a conspecific female and a leaf without an egg.

A grant to Dr Yuan Decheng (Academia Sinica, Beijing) enabled him to undertake collecting trips to the Qinling mountains in Shaanxi and to Mount Longqi in Fujian. Dr Yuan collected about 300 specimens of Gracillariidae, including material he is incorporating into a revision of the genus *Acrocercops*.

David Agassiz used his award for fieldwork in mapping the spread of *Phyllonorycter platani* in south-eastern Britain. This exciting work is part of a programme of research examining the establishment and rate of spread of Lepidoptera that have invaded Britain during the century.

The microscope bequeathed to the Hering Fund by Edward Pelham-Clinton, 10th Duke of Newcastle, continues to be lent to Dr Margaret Redfern-Cameron for her work on insects associated with thistles.

M. J. SCOBLE

LIBRARIAN'S REPORT

The theme of this year's report is back to normal at last. I spent the early part of the year compiling a list of possible book purchases to make up for the fact that no new books were purchased while the library was in store. This list was then discussed at a library committee meeting held in June from which a series of recommendations emerged which amounted to a potential expenditure of about £1350; so far approximately 70% of these have been purchased. Other subjects considered at this meeting were: whether the society should purchase new books in future from a single source, thus attracting a negotiated purchase discount; advice on subject classifications of certain books and future developments of the library as a service to members.

Progress has continued throughout the year on confirming that books were identified correctly against the accession number given to them in the library database, during the stocktake performed by volunteers in 1992. Further development of this database in terms of report formats, mail-merge letters, relational look-ups, search strategies, security functions and user instructions has continued concurrently. In this context the next step should be for the library computer committee to re-form to develop a specification for the purchase of a computer for use in the library.

The subject labelling of the library shelves was virtually completed by Martin Albertini in time for the formal opening of the library rooms in June. Many thanks are due to Martin for this work. John Muggleton has continued to compile listings of the journals and has continued to develop their arrangement, work for which I am most grateful. Andrew Halstead has also ably assisted me in the purchase of new books during the year. However despite all of this help due increasingly to the pressure on my spare time I have decided to resign as your librarian in February 1995, therefore a successor must be found, preferably during the next 3 months.

During the year the Hertfordshire Natural History Society announced that they wished to discontinue their journal exchange arrangement with us. A trip was made by me to Oxfordshire to recover some rare books from a member who was too ill to return them to the library. This trip was combined with the purchase and collection of some more new books. The last two functions are typical of the responsibilities attached to this position in the society.

For entomological books, separates and conservation reports sent to the library during the year, thanks are due to E. P. Wiltshire, Colin Plant, Sir Cyril Clarke, English Nature, the Countryside Council for Wales and the Biodiversity Challenge Group.

S. R. MILES

CURATOR'S REPORT

Last year future plans for the collections were projected in some detail and a start has been made towards achieving these aims. Work on rearranging the Coleoptera collections has continued as time allowed and 76 drawers have now been completed, the last six occupied by Cerambycidae, so the main phytophagous families are still to be covered.

The contents of the loose drawers of the Bretherton collection (Papilionidae, Pieridae and Nymphalidae) have been transferred to a 30-drawer cabinet and the Torstenius collection of Swedish Lepidoptera, which was till then in the care of the late Brad Ashby, was returned this January. The proposed reorganization of the Palaearctic butterfly collection will, however, await the availability of the two cabinets being cleared of the Massee Coleoptera collection.

There have been several donations during the year, including a substantial increase to our sawfly collections, i.e. 138 species provided by Andrew Halstead, who has corrected some of the older specimens; specimens of aculeate Hymenoptera were donated by Andrew Halstead and Raymond Uffen and of Homoptera by Bernard Verdcourt. Eighteen store boxes containing larger moths were received from Humphrey Mackworth-Praed, being the duplicate specimens from his father's collection which we received in 1991.

I am grateful to Peter Baker and Bill Parker for sorting the Lepidoptera accessions and for their ongoing selection of specimens to augment the society's main collections of this order. The number of duplicate specimens of Lepidoptera had become excessive and some weeding out of these is now taking place. It has been decided to eliminate the distinction between duplicate specimens freely available to members and the better specimens previously set aside for sale. In future, no attempt will be made to put a price on individual specimens and there will be a single collection of duplicate Lepidoptera, but any member taking specimens will be asked to make a discretionary donation to the society.

A loan has been made of 270 beetles of the family Ptiliidae to Colin Johnson, who revised our material of *Atomaria* some years ago and is now performing this task for *Acrotrichis* and its relatives.

A visit has been made by Adrian Pont to check the H. W. Andrews collection of Diptera for specimens mentioned in descriptions of new species by G. H. Verrall and J. E. Collin, who did not often designate type specimens; he has discovered syntypes of six species and has labelled them accordingly.

Some notes on the history and composition of the Diptera collection were circulated with the *Dipterist's Bulletin* and this has led to offers of material in some under-represented families. A similar account of the Coleoptera will soon be produced in an endeavour to encourage use of this collection. The request last year for input from coleopterists with respect to the layout and revision of the collection has so far resulted in limited response, although Peter Hodge has offered to advise where species believed to be unrepresented may be present under another name; this will give some idea where the attention of specialists would be desirable.

Peter Baker has volunteered to begin working towards an improved layout of the British moths and much thought is being given to the logistics of this considerable task. As always, any members wishing to advise or assist on any aspects of the arrangement would be welcomed.

I am also grateful to Frances Murphy for spending several open days cataloguing the fossil collection received from Ted Wild; her manuscript list has been placed with the collection.

In general there has been steady progress in a number of areas and the controlled environment at Dinton Pastures appears to have been beneficial despite some minor and one or two major fluctuations. We have, however, suffered from the remarkably hard water in the area, which is affecting the humidifying component of the air conditioning system, and water softening for this system is now under consideration.

A few *Anthrenus* larvae were found to have survived in the Bretherton collection and one instance of damage to specimens of the hornet was discovered but it is believed that we are currently free of such infestations.

PETER CHANDLER

EDITOR'S REPORT

As usual, the journal appeared four times in 1993, it contained 192 pages of text and five colour plates. The fifth colour plate, illustrating moths of the family Epermeniidae and the genus *Caryocolum* was actually printed in 1987, but held over until accompanying text was completed. It is one of several colour plates illustrating papers on the microlepidoptera which will eventually be published together in book form.

The indexes for 1991 and 1992 were published at the end of the year and publication of the journal has continued more or less as usual. There were, however, a few changes which I hope did not pass unnoticed.

We are now using a higher quality of paper, allowing even better reproduction of black and white line illustrations and half-tone figures and the cover is now printed on a stiff card. The redesign of the cover also allows a black and white half-tone picture to ornament it. To date most of these pictures have been supplied by the editor. However, all members are invited to submit photographs for reproduction on the journal's covers. The subject matter is open, with an emphasis on aesthetic value rather than scientific novelty and can be in the form of colour or black and white prints or colour transparencies.

RICHARD A. JONES

FIELDWORK AT DINTON PASTURES TO THE END OF 1993

PETER CHANDLER

There were three field meetings and several workshop meetings involving some fieldwork at Dinton Pastures from the completion of the society's building in 1992 and additional fieldwork was done on the Diptera throughout 1993. Information on the insect fauna of the Park was thus accumulating although much remained to be done.

The meeting on 20.ix.1992 was the inaugural open day at the building and a minority of those attending attempted fieldwork although a good start was made in several orders. There had been light trapping near the building by John Muggleton on the previous night and the weather was good for daytime collecting. A surprising range of species was recorded although the park showed evidence of the recent years of drought, with Mungell's Pond significantly lower than it was throughout 1993.

The two field meetings in 1993 were affected by variable weather conditions and less well attended but the daytime meetings were enjoyed by those who came. On 15.v despite predictions of bad weather the morning was fine although windy but sufficient shelter was found behind the hedges on the west side of Black Swan Lake. After a short shower in early afternoon, the sun broke through to illuminate afternoon collecting by the river Loddon. It rained again later and the evening was cold and windy, so that any idea of light trapping had to be abandoned.

The meeting on 18.ix enjoyed reasonable weather during the day. Most of the morning was spent by Mungell's Pond but an afternoon circuit reached Middle Marsh and Sandford Lake. The sky was clear and the evening cold so conditions were far from ideal although better than on many nights in the preceding weeks; it was, nevertheless, decided to try light trapping and David Young ran two lights in the fields adjacent to the Country Park Office until 11.30 pm and a few moths were recorded at the security lights around the buildings; he also tried sugaring trees in the vicinity but this attracted only earwigs.

The findings on these meetings and other useful records obtained on other occasions are detailed under the relevant order so that some idea can be given on the progress made in each group.

Lepidoptera. A booklet produced by the Local Authority in 1985 (on sale at the Country Park Office) included a list of 30 species of butterfly which had by then been reported from the park, several of them single sightings. Only eight species of butterfly were observed in 1993, although it was a poor year for them generally.

Bill Parker has periodically run light traps near the buildings over several years, but his records were lodged with the park authorities and except for one September visit have unfortunately been mislaid. Thus there are three lists now available for that month. The 1992 field meeting recorded 28 species, but in 1993 only 17 species were noted, 12 of them in common.

Fortunately there had been a field meeting of the Reading and District Natural History Society at the Park on 13.vii.1990 when lights were run near Mungell's Pond and 48 species were recorded (communicated to me by Brian Baker). A few other species have been recorded on day visits and Colonel A. M. Emmet reported 18 species, mostly "micros", on the occasion of the opening ceremony on 27.vii.1993. The latter included *Caloptilia rufipennella* (Hüb.) (vacated mines and tenanted cones on sycamore), believed to be new to Berkshire. Ron Parfitt has recorded *Nephopterix angustella* Hüb., which he reared on 29.vi from larvae mining berries of spindle tree. Caterpillars of *Tyria jacobaeae* L. were much in evidence on ragwort during the summer.

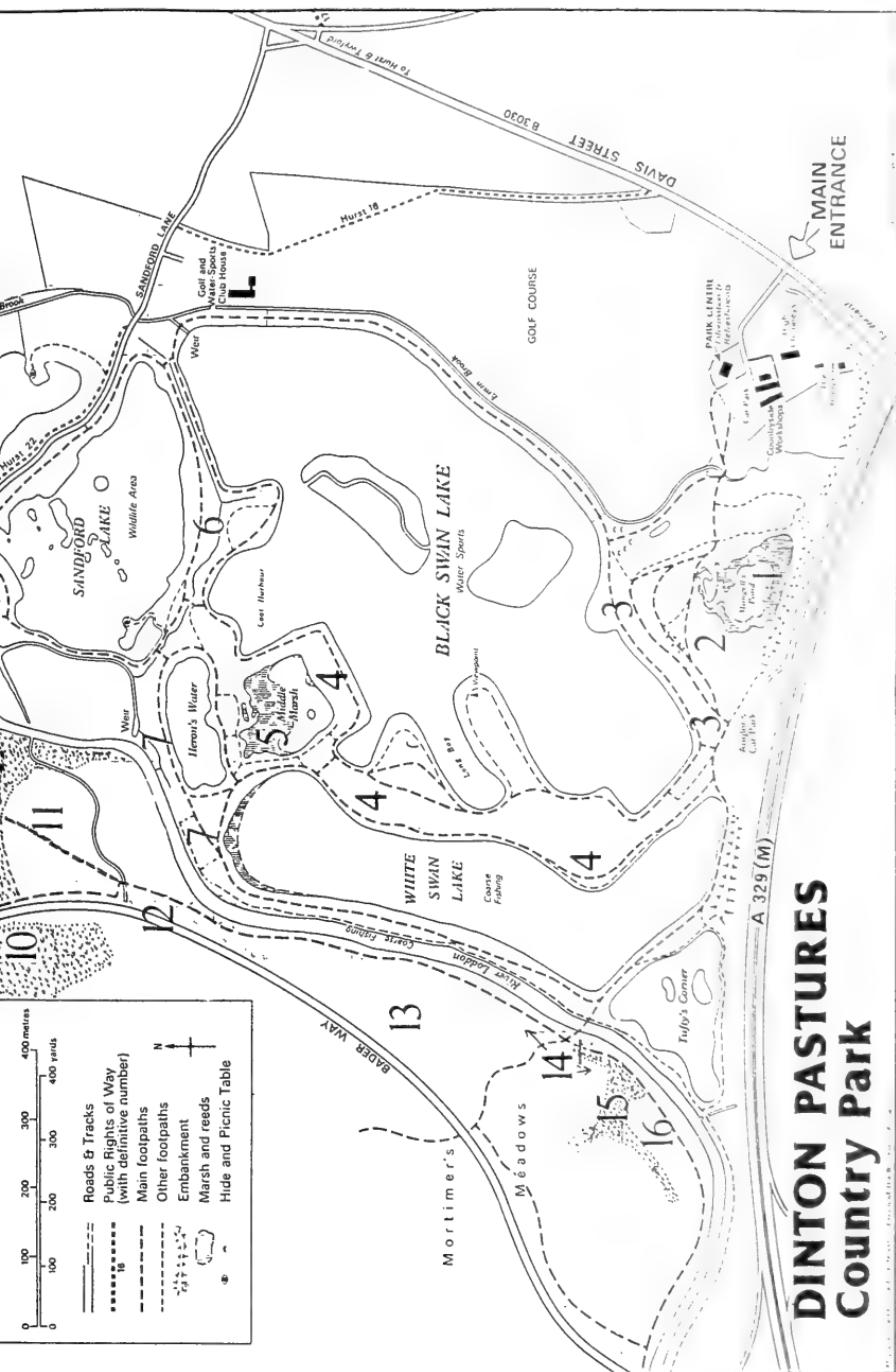


Fig. 1. Map of Dinton Pastures Country Park; numbers indicate areas described in text. Map prepared by the East Berkshire Group of the Ramblers' Association. Published by Wokingham District Council, July 1987.

Knowledge of the Lepidoptera is thus still at an early stage with little more than 100 species of moth so far recorded. Light trapping was thus arranged for several field meetings in 1994 to cover different parts of the Park and further investigation of the "micros" would also be welcomed.

Diptera. On the September 1992 field meeting Ian McLean concentrated attention in the vicinity of Mungell's Pond and found several species of interest, especially Dolichopodidae and Sciomyzidae, which he exhibited at the 1992 annual exhibition. On the same day I investigated the hedges and riverbanks for fungus feeders; I was surprised to find 36 species of fungus gnats including the very local *Megophthalmidia crassicornis* Curt. in two areas, and four species of Platopezidae. *Macquartia grisea* (Fall.) (Tachinidae), a parasite of chrysomelid beetles, was frequent, and two other species of the genus with similar habits have subsequently been found in the Park.

The Diptera Workshop on 8.v.93 preceded the first field meeting by a week, and morning fieldwork was productive, the most surprising find being *Meligramma euchroma* (Kowarz) (Syrphidae), which Alan Stubbs spotted on oak foliage; it is decidedly uncommon with larvae feeding on tree aphids. On the 15.v meeting about 150 species of Diptera were recorded, including 34 species of hoverfly and 14 species of cranefly. The cow parsley flowers near the river were attracting a good range of species including *Cheilosia vulpina* (Meig.) and *Parhelophilus frutetorum* (F.), while Ron Boyce was able to photograph *P. versicolor* (F.) sitting on foliage further along the river. Several other *Cheilosia* species were about including *C. honesta* Rond. and *Epistrophe nitidicollis* (Meig.) was found on oak foliage by the river. Gavin Boyd recorded *Xanthogramma pedissequum* (Harris) near Tufty's Corner. Several of the larger Tachinidae were seen including *Gymnocheta viridis* (Fall.) on tree trunks, *Tachina fera* (L.) and *Pelatachina tibialis* (Fall.) on foliage; the scarce species *Wagneria gagatea* R.-D. was found on both these May visits.

On 18.ix about 125 species of Diptera were recorded, with calypterates especially frequent and 11 species of Sciomyzidae were found; *Dichetophora oblitterata* (F.) was in numbers in the lane between the south end of the lakes and Andrew Halstead found *Ilione lineata* (Fall.), which specializes in the freshwater bivalves, near Mungell's Pond. This, with his find of *Euthycera fumigata* (Scop.) by Sandford Lake on the same day, brought the list of "snail-killing flies" (Sciomyzidae) for the Park to 30 (45% of the British species; the other 28 were exhibited by me at the 1993 Annual Exhibition). A few late syrphids on this occasion included *Cheilosia pagana* (Meig.) and *C. vernalis* (Fall.).

Much fieldwork was carried out on the Diptera on 26 other dates during 1993 and with the assistance of specialists in several families, most of the material has now been identified, enabling 975 species to be recorded. Both higher plant and fungus feeders are well represented. Among these were 11 currently afforded Red Data Book status and a further 43 "notable" species; a range of these as well as some species new to Britain were exhibited at the 1993 Annual Exhibition and are listed in the Exhibition report. Only a few other species are therefore mentioned here.

A dolichopodid *Nematoproctus distendens* (Meig.), which is found by woodland streams in the New Forest and otherwise recorded in Britain only from one site in Glos., was found in June and July around a muddy creek (Fig. 5) in Sandford Copse. *Eustalomyia hilaris* (Fall.) (Anthomyiidae), associated with Sphecidae nesting in rotten wood, was found in the carr at the south end of Mortimer's Meadow; most British records are from the Thames valley. *Volucella inanis* (L.) (Syrphidae) was observed in several areas during August. The aquatic Stratiomyidae have not been found but we know that *Stratiomys potamida* (L.) has occurred, as it was photographed by Ron Boyce on umbels near White Swan Lake on 30.vii.1985; it may have disappeared during the drought years.



Fig. 2. Mungell's Pond.



Fig. 3. West shore of Black Swan Lake, with old oaks in hedge behind.

Hymenoptera. The sawflies were well worked, mainly by Andrew Halstead, with 52 species already recorded. On 18.ix larvae of *Caliroa cerasi* (L.) were found on *Pyracantha* planted by the Society's building; on 20.xi.92 larvae had been found on the more regular foodplant cherry. The alder wood wasp, *Xiphydria camelus* (L.) was found on 23.v, near alders by the lakes, and *Hartigia xanthostoma* (Evers.), which mines meadowsweet stems as a larva, on 5.vi.

Little attention was given to the Aculeata in 1993, with only 25 species so far recorded, but queens of *Dolichovespula media* (Retz.) were noted between Mungell's Pond and the hedge south of Black Swan Lake on 8.v (when one was caught by Roger Leake) and again by me on 23.v. Most other species were determined by John Felton; these included three "notable" species: *Priocnemis hyalinata* (F.) (Pompilidae) and *Lestiphorus bicinctus* (Rossi) (Sphecidae) were found on Mortimer's Meadow on 31.vii, *Lasioglossum malachura* (Kirby) (Halictidae) near Mungell's Pond on 13.ix.

Seven species of gall wasp (two on rose, five on oak) were recorded on 20.ix by Ron Boyce and Andrew Halstead.

Neuroptera. Nine species were recorded, all determined by Colin Plant. *Micromus variegatus* (L.), a local grassland and scrub species has been recorded on both September field meetings and in July. *Sisyra fuscata* (F.) was found near Middle Marsh on 18.ix.

Homoptera. A nymph of *Ledra aurita* (L.) was found by the river on 20.ix by Roger Hawkins. *Cercopis vulnerata* Ill. was frequent in the park on 15.v.

Heteroptera. There are records of 31 species, mostly recorded by Roger Hawkins on 20.ix. Seven species of shield bug have been found including *Eysarcoris fabricii* (Kirkaldy) near White Swan Lake on 23.v and *Aelia acuminata* (L.) is frequent in the less disturbed areas of grassland. *Coreus marginatus* (L.) is often frequent on coarse herbage from July to September.

Odonata. There is a list of 22 species found in the park in the 1985 booklet. Eight species were recorded on the field meetings; the weather was wet on the day of the dragonfly workshop but observation of settled specimens nevertheless took place. *Calopteryx splendens* (Harris) was conspicuous by the river on 15.v. *Aeshna mixta* Lat. was frequent by the lakes during the September meetings.

Orthoptera. Five species have been recorded, including *Tetrix subulata* (L.) by Mungell's Pond on 20.ix and *Pholidoptera griseoaptera* (De Geer) elsewhere on the same day.

Coleoptera. There are still relatively few beetle records, although some species of interest occurred. *Anthocomus rufus* (Herbst) (Melyridae) was found by Mungell's Pond on the September meetings. The cardinal beetle *Pyrochroa serraticornis* (Scop.) was frequent on the riverbank on the May meeting. A *Platycis* species (Lycidae) was noted on low foliage in the hedge south of Black Swan Lake on 17.vi, the date suggests the little known *P. cosnardi* but this will require confirmation. Several species of Cerambycidae were noted, including *Phytoecia cylindrica* (L.), which develops in umbel stems, found on cow parsley flowers near the river on 15.v and other parts of the park later in May, and *Leptura livida* F. was generally frequent at umbels in June. Andrew Halstead observed exit holes of *Agrylus pannonicus* P. & M. (Buprestidae) in a moribund oak on Mortimer's Meadow on 13.vi and he also recorded the weevil *Notaris scirpi* F. by White Swan Lake and Mungell's Pond in June and August.

Araneae. Martin Askins recorded adults of 20 species and less determinate immatures of several others on 20.ix.92. A further 10 species were added in 1993 but knowledge of the spiders is still at a very early stage.

Habitats in the park. The accompanying map (Fig. 1) indicates the distribution of the principal habitat types (the areas described below are indicated by numbers on the map). The park is dominated today by a series of lakes which are



Fig. 4. River Loddon, looking north from bridge in Park.



Fig. 5. Sandford Copse, *Nematoprocus* creek (parallel with river at north end).



Fig. 6. Sandford Copse, Loddon Lilies in May.



Fig. 7. Mortimer's Meadows, near river at south end, looking north west to wooded area.

flooded gravel pits, but there are a number of older features, principally the river Loddon with many old alders on its banks and the hedges between the lakes which include many mature oaks. Most parts of the park have produced some insects of interest but several areas have been identified as of particular significance.

Mungell's Pond, which is the nearest wetland area to the society's building, supports a larger variety of insects than any area of comparable extent in the park. The open pond margins are dominated by *Typha* beds but there is a good range of marsh plants and an adjacent area of sallow carr grading into drier scrub and grassland. This area has been recently colonized but provides a valuable link to the hedges south of Black Swan Lake. Mungell's Meadow (2) is an adjoining enclosed area grazed by sheep, which was dominated by ox-eye daisy in the summer of 1993.

The mature hedges south of Black Swan Lake (3) and to a lesser extent those between the lakes (4) (Fig. 3) comprise two hedgebanks separated by a largely overgrown trackway (Mortimer's Way) and provide excellent shelter for shade-loving species and those associated with dead wood and fungi. Their continued existence has undoubtedly enabled many species to survive since before the days of gravel extraction, and a good number of woodland species have been found in these areas.

The several lakes have a great variety of marginal vegetation and have been colonized by many aquatic and plant-feeding species of insects, but relatively few "notable" species have been found by comparison with Mungell's Pond, suggesting that its wetland habitats are more ancient in origin. The reedbeds at the north end of White Swan Lake are, however, of some interest. Sandford Lake and Lavell's Lake at the north end of the Park are conservation areas for waterfowl.

Middle Marsh (5) is an area of tall mixed marsh vegetation with grass tussocks, surrounded by carr and hedges and bordering a small pond. Again few "notable" species have been found and much of the area was mown in September 1993 with the intention of encouraging the marsh orchids which otherwise occur in the park only around Mungell's Pond.

South of Sandford Lake (6) is an area of varied scrub and grassland habitats with a rich flora and a good range of insects requiring drier grassland have been found there.

The banks of the River Loddon (Fig. 4) are fringed by mature trees along the greater part of both banks and there are some broader areas of woodland, on the east side near Heron's Water (7) where a good concentration of dead wood and fungus feeding species has been found, and more especially on the west side where there is an area of carr at the south end and the more extensive Sandford Copse at the north end.

Sandford Copse (Fig. 5) comprises alderwood (8) near the river, including an area (outside the park boundary, near Sandford Mill) with SSSI status because of its large stand of loddon lily (*Leucojum aestivum* L.) (Fig. 6), and hazel coppice (9) dominated by bluebells in the spring on the higher ground near Bader Way. Bader Way Copse (10) on the other side of the road is a more extensive area of uncoppiced hazel; most of the hazel in Sandford Copse was coppiced during 1993. The alderwood areas have proved productive of uncommon Diptera especially near the river where a good amount of dead wood is present.

The entire area west of the river south of Sandford Copse is described as Mortimer's Meadows but is quite diverse. There is a field at the north end which develops tall marsh vegetation during the summer but has been extensively invaded by nettles, due to the lowering of the water table in the area following the construction of the housing estate on the other side of Bader Way. This field produced some good species early in the year but was mown in September 1993.

Where the river is closest to Bader Way there are some areas of herb rich grassland between a hedge and the road, where a high diversity of insects is present in a relatively

small area (12). The central areas include some planted copses of sallows and other trees and provide shelter for many insects. The greater part of the open areas was mown for hay in July 1993 and has produced little of interest, but an unmown fringe (14) dominated by thistles near the river supports a good number of insects.

At the south end of Mortimer's Meadows, between the small area of carr and drier woodland (15) and the river, there is an area of varied tall marsh vegetation, which has a diverse flora (16) (Fig. 7). Although this area too becomes dry in the summer, it has retained a good range of insects from the time when all the fields adjoining the river were grazed watermeadows and the adjoining carr provides shelter for woodland species.

The higher plants of the park were surveyed in 1993, augmenting an earlier list drawn up 10 years ago and there are plant lists for all the different areas, about 300 species having been recorded altogether. This remarkable diversity of habitats has enabled the large number of Diptera species found to survive despite all the changes in land use and the public pressure that is currently inevitable. The Country Park authorities agreed to take invertebrate conservation into account in the management plan being drawn up during 1994 and it is hoped that the next few years will see knowledge of all groups of insects in the area significantly increasing.

BENHS FIELD MEETING

Dinton Pastures, Berkshire, 21 May 1994

Leader: David Young. No doubt the meteorological records for 1994 will record yet another cold and wet spring, which was typified by the date chosen for this field meeting. Perversely the heavy rain and strong wind both stopped during the early evening and, with the temperature not unreasonable, five m.v. traps were run in the general area of the fishermen's car park on the western side of the country park. Unfortunately heavy and persistent rain returned soon after dark and the three members, and two guests, present had to work hard for the modest list of Lepidoptera species recorded.

Despite soaking wet foliage an attempt was made to beat for larvae. This effort quickly produced a fully grown larva of *Strymonidia w-album* (Knoch) beaten from hedgerow elm (*Ulmus* sp.), an interesting record both in terms of species recorded at Dinton Pastures and in view of the article by Peter Baker on the status of this species in north-west Surrey (*Br. J. Ent. Nat. Hist.* 1994; 7: 25). Other larvae recorded included *Operophtera brumata* (L.), *Apocheima pilosaria* (D. & S.), *Erannis defoliaria* (Cl.) and *Cosmia trapezina* (L.).

Moths recorded at m.v. light were: *Hepialus lupulinus* (L.), *Adela reaumurella* (L.), *Elachista argentella* (Cl.), *Esperia sulphurella* (F.), *Syndemis musculana* (Hüb.), *Olethreutes lacunana* (D. & S.), *Epiblema cynosbatella* (L.), *Xanthorhoe spadicearia* (D. & S.), *Xanthorhoe ferrugata* (Cl.), *Xanthorhoe montanata* (D. & S.), *Chloroclysta truncata* (Hufn.), *Thera obeliscata* (Hüb.), *Plagodis dolabraria* (L.), *Opisthograptis luteolata* (L.), *Biston betularia* (L.), *Cabera exanthemata* (Scop.), *Lomographa temerata* (D. & S.), *Mimas tiliae* (L.), *Laothoe populi* (L.), *Furcula furcula* (Cl.), *Pterostoma palpina* (Cl.), *Agrotis puta* (Hüb.), *Ochropleura plecta* (L.), *Diarsia rubi* (View), *Charanyca trigrammica* (Hufn.).

THE 1992 PRESIDENTIAL ADDRESS—PART 1. REPORT

JOHN MUGGLETON

30 Penton Road, Staines, Middlesex TW18 2LD.

My predecessor welcomed me to the chair with the words that the post of president was much less arduous than that of the honorary secretary. I can confirm that he was correct and, indeed, I now look forward to the even less arduous post of vice-president and, for the first time in many years, to be able to attend council meetings without having to say anything or take notes. Of course the work of the president is made much easier not only by those officials we have just re-elected, but also by the unelected officers whose names do not appear on the annual general meeting notice but who have some difficult jobs—Geoff Burton, the assistant treasurer; Andrew Godfrey, the membership secretary; David Young, the distribution secretary; Ian McLean, the indoor meetings secretary and Roger Morris, the field meetings secretary. All have important jobs, I would ask you to express our appreciation in the usual manner.

I now have the sad task of mentioning those of our members who have passed away during the year. The deaths of seven members and one former member have been brought to our attention during the year.

Mr I. BOLT joined the Society in 1990; he was an active lepidopterist who did much to found the Somerset Moth Group.

Mr L. E. COUCHMAN was, at the time of his death, the “father of the society”, having joined on 12 January 1922. He was a lepidopterist and lived at Hampstead at the time he joined the society. He attended the society’s meetings and was an occasional exhibitor. By 1947 he had moved to Tasmania where he remained until his death. Alas, I have been unable to find out any more about him.

Mr L. A. CRAM had been a member of the society for only a month when he died in February 1992.

Mr K. G. W. EVANS joined the Society in 1969 and will be remembered by many members for his work as exhibition secretary. He was an enthusiastic lepidopterist who was particularly interested in the macrolepidoptera of the Croydon area and who, with his son Laurie, published *A survey of the macrolepidoptera of Croydon and north-east Surrey* in 1973. He was an active member of the Croydon Natural History Society and was their president from 1975 to 1977. He published a number of notes in our *Proceedings* and in the *Entomologist’s Record*.

Mr. J. A. C. GREENWOOD joined the society in 1958 and was president in 1966. He was a lepidopterist who was also interested in general natural history and was a regular exhibitor at indoor meetings. He also led field meetings for the society. He will be remembered by many as a regular contributor, with his wife Dorothy, to the *Entomologist’s Record* with notes and accounts of collecting trips in Europe (and elsewhere) from the early 1960s to the 1980s. He was, at the time of his retirement, chief general manager of the Sun Alliance Insurance Group and gave the society much useful advice on financial and insurance matters. He was a member of the society’s finance committee at the time he died.

Mr D. A. NEAL joined the society in 1990 and was interested in the lepidoptera. I am afraid I have not been able to find out any more about him.

Mr L. H. NEWMAN was not a member at the time he died but was a member from 1926 to 1936 and from 1945 to the early 1960s. He will be remembered as the proprietor, in succession to his father L. W. Newman, of the butterfly farm at Bexley in Kent, and by my generation for his participation in the BBC children’s hour

programme *Nature Parliament* under the chairmanship of Derek McCulloch (Uncle Mac). He wrote many popular books and articles on butterflies, moths and natural history and an autobiography, *Living with butterflies*. He retired from the butterfly farm in 1966.

Mr E. H. WILD first joined the society in 1946 and was a member of the society's council from 1949 to 1951. After a lapse in membership he rejoined the society in 1971 and was honorary secretary from 1978 to 1980. Starting out as a macrolepidopterist he turned his attention to the microlepidoptera in the late 1970s and was able to record a species new to Britain, *Elachista littoricola*. He published many entomological notes and his great sense of humour led him to publish a short series in the *Entomologist's Record* on "mothmanship" in 1989 and 1990.

The year 1992 was the 121st of the society's existence and an *annus mirabilis*. For the first time in its history the society has a permanent base for its library and collections. Accommodation or, more correctly, its termination has always been a worry to the society's council; we can now relax and plan ahead for the next 70 years. It is inevitable that the society will change as a result, but change, properly managed, is no bad thing. New traditions can now be set up and the best of the old retained. To this end I have volunteered in my "retirement" to redraft the society's bye-laws with particular reference to the section on membership. This is a very difficult society to join!

The first indications are that the move to Dinton Pastures has been a success. An initial field meeting at an unpromising time in the autumn produced an above average species list and the weekend openings are attracting a good attendance, including members from further afield who we otherwise used only to see at the annual exhibition. Both the librarian and curator are already complaining of lack of space; with foresight a larger building would have been possible. Alas the roof space is taken up with a problematic air conditioning plant which is still adding to the curator's worries. As you will remember the building was made possible by a generous bequest from our late member Edward Pelham-Clinton, 10th Duke of Newcastle. The building will be named the Pelham-Clinton Building in his memory and a plaque will be mounted inside to record his bequest and the several others that have helped to put the society on a firm financial footing.

Our thanks must go to our present treasurer and his predecessor, Col. D. H. Sterling, for their excellent management of the society's finances and investments. As you will have heard from the treasurer's report the society is now in a firm financial position. When the council agonized over whether to proceed with the Pelham-Clinton building some saw financial ruin ahead and all of us had our doubts. However the economic depression, which has brought hardship to many, has benefited the society which had a large sum of money to invest at a time when interest rates were high. A consequence of this is that the society must now decide how best to use its surplus funds for the benefit of entomology, something which, as a charity, we must consider very seriously indeed. I hope that future councils will rise to this challenge.

The society's journal under the stewardship of our editor, Richard Jones, who has occasionally boldly dared to go where no Editor before him has gone, has become an excellent publication. It remains our only link with many members and their continuing membership is a sign of its value. It is also an excellent ambassador for the society in the entomological world. I wish it and the society continuing success.

BRITISH ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY

INSTRUCTIONS TO AUTHORS

General. Contributions must be double-spaced on one side only on A4 paper with 3-cm margins either side to facilitate marking up. Layout should follow that of the journal, but apart from underlining scientific names, no marks should be made to define typeface.

Two copies of typescripts and figures are required, the second copy can be a photocopy. Authors who have prepared their article on word processor are invited to supply a disk also.

Nomenclature. Use the most up-to-date nomenclature available. After first use of a specific Latin name give the author's name; use parentheses only if required according to the rules of nomenclature. This should apply not only to insect names, but also to the names of plants, non-insect invertebrates and other animals.

Figures and tables. Line figures and half-tones are accepted. Size of lettering, thickness of lines and density of shading, stippling and hatching must take into account likely reduction in size to fit appropriately into the journal page size. Illustrations must be of good quality, however lettering can be typeset if necessary; indicate requirements on a duplicate figure. Colour illustrations may be available, please contact the editor. Tables should be prepared on separate sheets; avoid vertical rules, use horizontal rules sparingly.

References. In the text, references should give author and year, (e.g. Allan, 1947); multiple references (e.g. Kendall, 1982; Smith, 1989; Baker, 1994) should be listed in date order. But references should be listed in alphabet order at the end of the article. Book titles take only an initial capital letter. Journal titles are abbreviated in the style of the World List, but with each word taking an initial capital. Examples:

Allan, P. B. M. 1947. *A moth-hunter's gossip*. 2nd edn, Watkins and Doncaster, London, p. 149.
Baker, P. 1994. The modified status of *Strymonidia v-album* (Knobch) (Lepidoptera: Lycaenidae) in north west Surrey. *Br. J. Ent. Nat. Hist.* 7: 25-26.
Kendall, P. 1982. *Bromius obscurus* (L.) in Britain (Col., Chrysomelidae). *Entomologist's Mon. Mag.* 117 (1981): 233-234.
Pratt, C. R. & Emmet, A. M. 1989. *Polygonia*. In: Emmet, A. M. & Heath, J. (Eds). *The moths and butterflies of Great Britain and Ireland*. Harley Books, Colchester, Vol. 7, Part 1, pp. 212-215.
Smith, K. G. V. 1989. An introduction to the immature stages of British flies: Diptera larvae, with notes on eggs, puparia and pupae. *Handbk Ident. Br. Insects* 10(14): 1-280
Stubbs, A. E. 1987. *Oxycera dives*. In: Shirt, D. B. (Ed.). *British red data books: 2. Insects*. Nature Conservancy Council, Peterborough, pp. 304-305.
Stubbs, A. E. & Falk, S. J. 1983. *British hoverflies: an illustrated identification guide*. BENHS, London, pp. 191-192.
West, B. K. 1994. The time of appearance of *Laconobia oleracea* L. (Lep.: Noctuidae) in the British Isles. *Entomologist's Rec. J. Var.* 106: 81-84.

Offprints. Authors of main articles receive 25 free offprints taken directly from the journal. These may contain extraneous matter such as short communications or book reviews used as 'fillers'. Extra copies may be ordered when proofs are returned.

THE PROFESSOR HERING MEMORIAL RESEARCH FUND

The British Entomological and Natural History Society announces that awards may be made from this fund for the promotion of entomological research with particular emphasis on:

- (a) leaf-miners
- (b) Diptera, particularly Tephritidae and Agromyzidae
- (c) Lepidoptera, particularly Microlepidoptera
- (d) general entomology

in the above order of preference having regard to the suitability of applicants and the plan of work proposed.

Awards may be made to assist travelling and other expenses necessary to fieldwork, for the study of collections, for attendance at conferences, or, exceptionally, for the costs of publication of finished work. In total they are unlikely to exceed £600 in 1994/95.

Applicants should send six copies, if possible, of a statement of their qualifications, of their plan of work, and of the precise objects and amount for which an award is sought, to Dr M. J. Scoble, Department of Entomology, The Natural History Museum, Cromwell Road, London SW7 5DB, as soon as possible and not later than 30 September 1994.

Applications are also invited from persons wishing to borrow the Wild M3 stereomicroscope and fibre optics illuminator bequeathed to the fund by the late Edward Pelham-Clinton, 10th Duke of Newcastle. Loan of this equipment will be made for a period of up to six months in the first instance.

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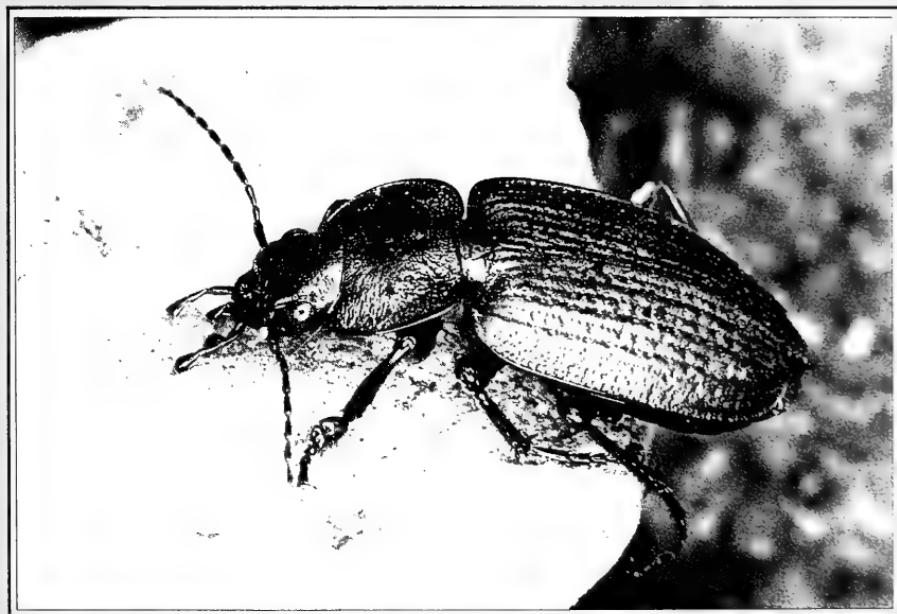
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Meetings of the Society are held regularly in London, at the rooms of the Royal Entomological Society, 41 Queen's Gate, London SW7 and the well-known ANNUAL EXHIBITION is planned for 22 October 1994 at Imperial College, London SW7. Frequent Field Meetings are held at weekends in the summer. Visitors are welcome at all meetings. The current Programme Card can be had on application to the Secretary, R. F. McCormick, at the address given below.

The Society maintains a library, and collections at its headquarters in Dinton Pastures, which are open to members on the second and fourth Sundays of each month, telephone 0734-321402 for the latest meeting news.

Applications for membership to the Membership Secretary: A. Godfrey, 10 Moorlea Drive, Baildon, Shipley, West Yorkshire BD17 6QL.

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Cover illustration: Carabid beetle. Photo: R. Williams.

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FACTORS AFFECTING HABITAT PREFERENCES IN THE LEPIDOPTERA

MICHAEL MAJERUS, ANNE-LISA GRIGG, CARYS JONES, FIONA SALMON,
ANDREW STRATHDEE AND NICHOLAS DEARNALEY

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BENTON 1994
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It is well known that many species of Lepidoptera have specific habitat requirements, and that their geographic distribution, at least in part, reflects the availability of favourable habitats. Habitat favourability may depend on presence of larval or adult food resources, appropriate adult roosting sites, suitable conditions for flight and so on. However, little comparative work has been done to address several questions. Are habitat biases active or passive? Do Lepidoptera actively seek and then stay in favourable habitats, or do those in favourable habitats survive and reproduce while those in other habitats die? What factors affect habitat preferences? How strong may habitat preferences be?

Results of a single night's light trapping in 1984 suggested that in some species, preferences could be active and strong. Two Heath moth traps, operated 50 yards apart, one in a Douglas fir (*Pseudotsuga menziesii* (Mirbel)) plantation, the other in mixed deciduous woodland, produced quite different catches. For example, all *Hylaea fasciaria* were taken in the conifer plantation trap. Conversely, all *Diarsia mendica* were taken in the deciduous woodland trap. Furthermore, of polymorphic species, such as *Semiothisa liturata* and *Alcis repandata*, significant differences were found in the frequencies of forms in the two habitats (Kearns & Majerus, 1987). Other workers have found similar results in respect of a number of polymorphic species (Jones *et al.*, 1993; Aldridge *et al.*, 1993; Fraiers *et al.*, in press).

Waring (1989) has published results of a more extensive trapping run. During 1984 and 1985 he operated Heath traps one night a week in three contrasting woodland habitats in Bernwood Forest; conifer plantation, overgrown coppice broad-leaf and newly coppiced broad-leaf. Taking account of the differences of shading at trap sites, following Bowden (1982), he compared the catches of moths in overgrown coppiced broad-leaf woodland with those in conifer plantation and newly coppiced broad-leaf. Of 50 species of moth taken in sufficient numbers to allow analysis, only one, *Agriopis aurantaria* was shown to have no significant preference in either comparison for both years. More preferences were for the overgrown coppice than for the more man-managed habitats, but it is interesting to note that for each of the ten species shown to have a preference for conifer plantation, the preference was consistent between years.

Waring's data transformation, based on Bowden's formula of trapping efficiency being correlated to background illumination, is open to criticism. Recently, Dearnaley *et al.* (in prep.), have shown that the trapping efficiency of moth traps depends not only on degree of shading, but also on bulb strength, bulb height, trap design and the height of the trap above the ground. However, for many species, Waring's statistical findings are robust, even if the data are not transformed.

Waring (1989) interprets his results primarily in the light of larval foodplants and adult roosting sites. The habitat preferences shown by many, but not all, species make sense in terms of what is known about these factors. However, microclimatic factors such as temperature, humidity, windspeed etc., which may affect flight, are not considered. This may be because Waring considered that such factors would not differ significantly between his trapping sites, all being in woodland of one sort or another.

In this paper we present data obtained by running paired moth traps, within sight of each other, either side of a sharp habitat boundary between dense woodland and open grassland. The results are discussed in relation to the factors which may affect habitat specialization, including larval foodplants, roosting sites and microclimatic differences between trap sites which may affect flight.

METHODS

Trapping was carried out using paired light traps between 16 and 30 June, 1989 and between 28 June and 6 July 1990, in Juniper Bottom, Box Hill, Surrey. Juniper Bottom is an east-west running valley. The vegetation in the bottom of the valley is chalk grassland, close-cropped by rabbits, with a few standard broad-leaf trees and patches of mixed broad-leaf scrub. It is very rich in terms of number of plant species. Conversely, large areas of both sides of the valley are covered by mature yew woodland. The canopy of this woodland is extremely dense, and the under canopy is dark with virtually no ground vegetation except beneath occasional deciduous trees, such as whitebeam, and below breaks in the canopy caused by the 1987 October gales. The boundary between these yew-covered slopes and the bottom of the valley is sharply defined, consisting of a rather impenetrable natural mixed broad-leaf hedge. The site was chosen for this study because of the contrast between the habitats either side of the hedge. The extreme paucity of the ground vegetation under the yew, large parts of the yew woodland effectively being a natural monoculture, provide a sharp contrast to the species richness of the chalk grassland. A list of the identified species of plants growing within 5 m of the traps in the two habitats is given in Table 1.

Up to three pairs of traps were run on a night. Three types of trap were used; 125-W Robinson traps; 100-W 'dustbin' traps and 12-W Heath traps, both traps of a pair being the same type. Robinson and dustbin traps were powered by E650 Honda generators. Heath traps were powered by 12-V car batteries. One trap of each pair was set up approximately 10 m inside the yew woodland, the other being placed approximately 10 m outside the yew wood in the chalk grassland. In 1989, the positions of pairs of traps along Juniper Bottom varied between nights. In 1990, three pairs of trapping sites were occupied each night, the types of trap at each site varying between nights. Traps were run for 3–4 h between 9.30 p.m. and 1.30 a.m.

When trapping was terminated for a night, the traps were stoppered and transported to Juniper Hall Field Studies Centre, where the catches were scored the following morning. All macrolepidoptera were identified except the pugs (excluded due to time constraints and the inexperience of the scorers with this group).

In 1990, measurements of windspeed, temperature and humidity were taken, at each trap site, at intervals throughout the trapping period. Windspeed was measured over 10-min periods using a cup anemometer. Temperature and humidity were measured using a whirling hydrometer. Readings of light intensity at different sites in each habitat were taken using a photographic light meter.

Table 1. Plant species within five metres of (a) the traps inside the yew woodland and (b) the traps in the chalk grassland.

- (a) yew, mosses, dogs mercury, whitebeam, lichens.
- (b) silverweed, nettles, thistles, hawthorn, dogs mercury, hairy saint john's wort, bramble, hogweed, speedwell, bedstraws, dark mullein, marjoram, thyme, ribbed melilot, convolvulus, dead-nettle, docks, plantains, buttercups, beech, fine-leaved sandwort, mouse ear, clovers, dogwood, wood sage, hazel, beaked hawk's-beard, bugle, crosswort.

RESULTS

The total number of individuals taken in the yew woodland and the chalk grassland habitats, for each species, over the two trapping periods combined, are given in Table 2. The species are named and ordered following Skinner (1984).

Because only one anemometer was available, windspeed could only be assessed in one habitat at a time, so the two habitats could not be monitored concurrently. The data, while showing windspeed to be generally lower in the yew woodland than outside it, are not strictly comparable. However, further work in Juniper Bottom, in 1991 and 1992, using paired anemometers, has shown that the mean windspeed is markedly lower in the yew woodland than outside it (Fraiers & Cox, pers. comm.). In 1990, and subsequent years, the temperature inside the yew woodland was generally the same as, or slightly lower than, that in the grassland when trapping began each night, but declined less rapidly, so that by the end of trapping it was fairly consistently 0.5–1.5°C higher inside the yew woodland.

The background light intensity, measured during the day, was substantially higher in the grassland than in the yew, the mean ratio being 32.2:1.

ANALYSIS

For species taken in reasonable numbers (more than 10) over the 2 years, the number of moths taken inside and outside the woodland was compared using the chi-squared test (a statistical test which estimates the probability of any bias in the actual result, away from the expected result, being due to chance alone, i.e. sampling error). Initially tests were performed using the simple expectation that there was an equal probability of a moth being caught in either habitat: i.e. an expected ratio of 0.5:0.5 for a species in the two habitats. The normal level of statistical significance, that there is less than a 5% probability of any deviation in the observed data away from expectation being due to chance sampling error alone, is used. The results of these analyses are given in Table 3.

Of course, these tests may be unreliable were traps in one habitat much more efficient in attracting and catching macrolepidoptera than those in the other habitat. The total number of moths of all species recorded in each habitat (1624 in the yew wood, 883 in the grassland) show that this might be the case. One method of circumventing this problem would be to bias the chi-squared expectations by the ratio of total moths captured in each type of habitat. This would give an expectation ratio of 0.648:0.352. The results of repeating the chi-squared tests with these transformed expectations are also given in Table 3.

This statistical recourse could also be criticized because the greater number of moths taken in the yew woodland traps, compared to the grassland traps, is primarily a consequence of four common species, *Idaea versata*, *Peribatodes rhomboidaria*, *A. repandata* and *Campaia margaritata*, which all show significant bias towards the yew woodland, with either expectation ratio. If the data for these four species are removed from the catch totals for each habitat, these are reduced to 699 for yew woodland and 652 for chalk grassland.

It is notable that there is general tendency for geometrid species to be taken in larger numbers in the yew woodland and noctuid species to be taken in larger numbers in the grassland. This may result from differences in windspeed in the two habitats. The windspeed in woodland is generally lower than in open habitats. This has been confirmed for the two habitats in question. The yew woodland may thus provide sheltered conditions that would be more conducive to flight for

Table 2. Total number of moths caught in yew woodland and chalk grassland. The class of build of each species used in statistical analysis (see text) is given: D = delicate, R = robust, ? = uncertain.

Species	Build	In yew wood	In grassland	Total
<i>Hepialus lupulinus</i> L.	?	0	1	1
<i>Drepana falcataria</i> L.	D	0	2	2
<i>Thyatira batis</i> L.	R	4	5	9
<i>Habrocytus pyritooides</i> Hufn.	R	1	4	5
<i>Ochropacha duplaris</i> L.	R	3	1	4
<i>Hemitea aestivaria</i> Hübn.	D	6	4	10
<i>Cyclophora linearia</i> Hübn.	D	7	16	23
<i>Timandra griseata</i> Petersen	D	3	0	3
<i>Idaea biselata</i> Hufn.	D	18	3	21
<i>Idaea dimidiata</i> Hufn.	D	3	1	4
<i>Idaea trigeminata</i> Haw.	D	2	3	5
<i>Idaea aversata</i> L.	D	103	33	136
<i>Xanthorhoe fluctuata</i> L.	D	2	0	2
<i>Scotopteryx bipunctaria</i> D. & S.	D	2	0	2
<i>Epirrhoë alternata</i> Müller	D	0	1	1
<i>Epirrhoë rivata</i> Hübn.	D	0	2	2
<i>Camptogramma bilineata</i> L.	D	3	0	3
<i>Cosmorrhœa ocellata</i> L.	D	11	2	13
<i>Ecliptopera silaceata</i> D. & S.	D	0	1	1
<i>Chloroclysta truncata</i> Hufn.	D	10	11	21
<i>Cidaria fulvata</i> Forster	D	4	4	8
<i>Plemyria rubiginata</i> D. & S.	D	5	1	6
<i>Thera obeliscata</i> Hübn.	D	14	6	20
<i>Thera</i> sp.	D	2	0	2
<i>Electrophaes corylata</i> Thunb.	D	0	1	1
<i>Colostygia pectinataria</i> Knoch	D	14	27	41
<i>Hydriomena furcata</i> Thunb.	D	9	14	23
<i>Horisme vitalbata</i> D. & S.	D	1	0	1
<i>Horisme tersata</i> D. & S.	D	28	14	42
<i>Melanthis procellata</i> D. & S.	D	6	8	14
<i>Philereme vetulata</i> D. & S.	D	5	6	11
<i>Philereme transversata</i> Hufn.	D	4	1	5
<i>Perizoma flavofasciata</i> Thunb.	D	1	0	1
<i>Hydrelia flammeolaria</i> Hufn.	D	4	0	4
<i>Lomasplilis marginata</i> L.	D	2	3	5
<i>Ligdia adustata</i> D. & S.	D	1	1	2
<i>Semiothisa notata</i> L.	D	1	0	1
<i>Semiothisa liturata</i> Clerck	D	18	8	26
<i>Plagodis dolabraria</i> L.	D	3	0	3
<i>Opisthograptis luteolata</i> L.	D	18	5	23
<i>Crocallis elinguaria</i> L.	?	5	2	7
<i>Ourapteryx sambucaria</i> L.	D	12	1	13
<i>Biston betularia</i> L.	?	4	4	8
<i>Peribatodes rhomboidaria</i> D. & S.	D	223	64	287
<i>Deileptenia riveata</i> Clerck	D	11	0	11
<i>Alcis repandata</i> L.	D	527	117	644
<i>Boarmia robararia</i> D. & S.	D	1	0	1
<i>Serraca punctinalis</i> Scop.	D	0	1	1
<i>Ectropis bistortata</i> Goeze	D	11	1	12
<i>Ectropis crepuscularia</i> D. & S.	D	10	6	16
<i>Paradarisa extersaria</i> Hübn.	D	2	0	2
<i>Cabera pusaria</i> L.	D	16	5	21
<i>Cabera exanthemata</i> Scop.	D	9	2	11
<i>Lomographa temerata</i> D. & S.	D	1	4	5
<i>Campaea margaritata</i> L.	D	72	17	89
<i>Hylaea fasciaria</i> L.	D	11	3	14
<i>Sphinx ligustri</i> L.	R	3	8	11
<i>Hyloicus pinastri</i> L.	R	1	3	4
<i>Phalera bucephala</i> L.	R	0	1	1
<i>Stauropus fagi</i> L.	R	3	6	9
<i>Notodontia dromedarius</i> L.	R	0	1	1
<i>Pheosia gnoma</i> F.	R	1	1	2
<i>Ptilodon capucina</i> L.	R	3	1	4

Table 2. (cont.).

Species	Build	In yew wood	In grassland	Total
<i>Lymantria monacha</i> L.	?	1	0	1
<i>Eilema griseola</i> Hüb.	?	1	3	4
<i>Eilema deplana</i> Esper	?	0	1	1
<i>Eilema lurideola</i> Zincken	?	3	2	5
<i>Spilosoma lubricipeda</i> L.	R	1	1	2
<i>Spilosoma luteum</i> Hufn.	R	1	8	9
<i>Nola confusalis</i> H.-S.	D	5	0	5
<i>Agrotis segetum</i> D. & S.	R	1	4	5
<i>Agrotis clavis</i> Hufn.	R	4	9	13
<i>Agrotis exclamationis</i> L.	R	71	99	170
<i>Agrotis puta</i> Hüb.	R	1	0	1
<i>Axylia putris</i> L.	R	13	8	21
<i>Ochropleura plecta</i> L.	R	11	3	14
<i>Noctua pronuba</i> L.	R	9	8	17
<i>Lycophotia porphyrea</i> D. & S.	R	0	1	1
<i>Diarsia mendica</i> F.	R	0	1	1
<i>Diarsia brunnea</i> D. & S.	R	5	3	8
<i>Diarsia rubi</i> Vieweg	R	0	1	1
<i>Xestia c-nigrum</i> L.	R	0	1	1
<i>Xestia triangulum</i> Hufn.	R	1	4	5
<i>Anaplectoides prasina</i> D. & S.	R	8	5	13
<i>Hada nana</i> Hufn.	R	7	4	11
<i>Polia nebulosa</i> Hufn.	R	2	4	6
<i>Melanchnra persicariae</i> L.	R	8	2	10
<i>Lacanobia thalassina</i> Hufn.	R	6	3	9
<i>Lacanobia oleracea</i> L.	R	1	5	6
<i>Hecatera bicolorata</i> Hufn.	R	0	3	3
<i>Hadena bircuris</i> Hufn.	R	0	1	1
<i>Mythimna ferrago</i> F.	R	0	1	1
<i>Mythimna impura</i> Hüb.	R	1	4	5
<i>Mythimna pallens</i> L.	R	4	19	23
<i>Mythimna comma</i> Hüb.	R	1	3	4
<i>Acronicta rumicis</i> L.	R	2	5	7
<i>Craniophora ligustris</i> D. & S.	R	0	1	1
<i>Dypterygia scabriuscula</i> L.	R	1	3	4
<i>Rusina ferruginea</i> Esper	R	2	12	14
<i>Euplexia lucipara</i> L.	R	6	3	9
<i>Phlogophora meticulosa</i> L.	R	1	3	4
<i>Apamea monoglypha</i> Hufn.	R	33	28	61
<i>Apamea lithoxylaea</i> D. & S.	R	3	5	8
<i>Apamea sublustris</i> Esper	R	38	42	80
<i>Apamea crenata</i> Hufn.	R	2	4	6
<i>Apamea epomidion</i> Haw.	R	2	0	2
<i>Apamea anceps</i> D. & S.	R	0	1	1
<i>Oligia</i> spp.	R	5	8	13
<i>Mesapamea secalis</i> L.	R	1	5	6
<i>Charanya trigrammica</i> Hufn.	R	2	3	5
<i>Hoplodrina alsines</i> Brahm	R	1	5	6
<i>Hoplodrina blanda</i> D. & S.	R	2	5	7
<i>Caradrina morphetus</i> Hufn.	R	5	9	14
<i>Lithacodia pygarga</i> Hufn.	R	3	14	16
<i>Diachrysia chrysitis</i> L.	R	3	8	11
<i>Autographa gamma</i> L.	R	0	4	4
<i>Autographa pulchrina</i> Haw.	R	18	30	48
<i>Autographa iota</i> L.	R	1	3	4
<i>Abrostola triplasia</i> L.	R	10	1	11
<i>Lygephila pastinum</i> Treits.	R	1	1	2
<i>Phytometra viridaria</i> Clerck	?	1	0	1
<i>Laspeyria flexula</i> D. & S.	D	16	12	28
<i>Rivula sericealis</i> Scop.	?	6	12	18
<i>Hypena proboscidalis</i> L.	D	25	6	31
<i>Pechipogo strigilata</i> L.	D	11	0	11
<i>Herminia nemoralis</i> F.	D	13	2	15
Total		1624	883	2507

Table 3. Chi-squared analysis comparing the number of moths of each species in yew woodland and chalk grassland. Criterion for inclusion: more than 10 moths taken. Two series of tests using different expected ratios are given. In the first (A) the expected likelihoods of a moth being caught in either habitat are equal. In the second (B) the probability of being caught in a particular habitat is weighted by the number of all moths caught in that habitat as a proportion of all moths in both habitats i.e. 0.648 for yew woodland, and 0.352 for chalk grassland. The direction of significant biases are given, with probability confidence limits (ns means non-significant, i.e. the bias could be due to chance sampling error. Degrees of freedom = 1 throughout).

Species	Chi-squared (χ^2) analysis	
	A χ^2 ; p; bias	B χ^2 ; p; bias
<i>Hemithea aestivaria</i>	ns	ns
<i>Cyclophora linearia</i>	ns	11.89; <0.001; grass
<i>Idaea biselata</i>	10.71; <0.005; yew	4.04; <0.05; yew
<i>Idaea versata</i>	36.03; <0.001; yew	7.13; <0.01; yew
<i>Cosmorhoe ocellata</i>	6.23; <0.05; yew	ns
<i>Chloroclysta truncata</i>	ns	ns
<i>Thera obeliscata</i>	ns	ns
<i>Colostygia pectinataria</i>	4.12; <0.05; grass	17.0; <0.001; grass
<i>Hydriomena furcata</i>	ns	6.64; <0.01; grass
<i>Horisme tersata</i>	4.67; <0.05; yew	ns
<i>Melanthis procellata</i>	ns	ns
<i>Philereme vetulata</i>	ns	ns
<i>Semiothisa liturata</i>	3.85; <0.05; yew	ns
<i>Opisthograptis luteolata</i>	7.35; <0.01; yew	ns
<i>Ouraapteryx sambucaria</i>	9.31; <0.005; yew	4.18; <0.05; yew
<i>Peribatodes rhomboidaria</i>	88.09; <0.001; yew	20.9; <0.001; yew
<i>Deileptenia ribeata</i>	11.00; <0.001; yew	5.40*; <0.05; yew
<i>Alcis repandata</i>	261.02; <0.001; yew	81.80; <0.001; yew
<i>Ectropis bistortata</i>	8.33; <0.005; yew	ns
<i>Ectropis crepuscularia</i>	ns	ns
<i>Cabera pusaria</i>	5.76; <0.05; yew	ns
<i>Cabera exanthemata</i>	4.45; <0.05; yew	ns
<i>Campaea margaritata</i>	33.99; <0.001; yew	10.11; <0.005; yew
<i>Hylaea fasciaria</i>	4.57; <0.05; yew	ns
<i>Agrotis clavis</i>	ns	6.51; <0.01; grass
<i>Agrotis exclamationis</i>	4.61; <0.05; grass	39.56; <0.001; grass
<i>Axylia putris</i>	ns	ns
<i>Ochropleura plecta</i>	4.57; <0.05; yew	ns
<i>Noctua pronuba</i>	ns	ns
<i>Anaplectoides prasina</i>	ns	ns
<i>Hada nana</i>	ns	ns
<i>Mythimna pallens</i>	9.78; <0.005; grass	22.64; <0.001; grass
<i>Rusina ferruginea</i>	7.14; <0.01; grass	15.67; <0.001; grass
<i>Apamea monoglypha</i>	ns	ns
<i>Apamea sublustris</i>	ns	10.49; <0.005; grass
<i>Oligia spp.</i>	ns	3.94; <0.05; grass
<i>Caradrina morpheus</i>	ns	5.19; <0.05; grass
<i>Lithacodia pyrga</i>	7.12; <0.01; grass	16.60; <0.001; grass
<i>Diachrysia chrysitis</i>	ns	5.41*; <0.05; grass
<i>Autographa pulchrina</i>	ns	15.67; <0.001; grass
<i>Abrostola triplasia</i>	8.33; <0.005; yew	ns
<i>Laspeyria flexula</i>	ns	ns
<i>Rivula sericealis</i>	ns	7.80; <0.01; grass
<i>Hypena proboscidalis</i>	11.65; <0.001; yew	ns
<i>Pechipogo strigilata</i>	11.00; <0.001; yew	5.40*; <0.05; yew
<i>Herminia nemoralis</i>	8.07; <0.005; yew	ns

*Yates' correction used for low expected values.

Table 4. Comparison of numbers of 'delicate' compared to 'robust' moths taken in yew woodland and chalk grassland. Only data from those species which did not give a significant result in the analyses given in Table 3 are included.

	Yew Woodland	Chalk Grassland	Totals
Delicate	129	85	214
Robust	149	194	342
Totals	277	279	556

Heterogeneity Chi-squared = 15.24; d.f. = 1; $P < 0.001$.

light-bodied, large-wing-area species, as characterized by the geometrids. On the other hand, for the more robust build characteristic of many noctuids, shelter from wind may not be of such great importance. Of course, not all geometrids are 'delicate' and not all noctuids 'robust'. To consider this further, all species were categorized as either delicate (D) or robust (R). The categories are given in Table 2. In a small number of cases the category that a species should be placed in was not obvious, and these species have been omitted from the analysis. The number of moths of species which showed no significant bias to either habitat in either of the analyses given in Table 3, and all those taken that were not analysed due to insufficient numbers taken, were totalled under the assigned classes D and R for each habitat. The results are given in Table 4. A heterogeneity chi-squared test, comparing the ratios of the classes between the two habitats shows that overall the 'delicate' species are taken in significantly higher numbers in the yew woodland than the grassland, the reverse being the case for the 'robust' species.

DISCUSSION

Consideration of the species taken in large enough numbers for individual analysis, suggests that, with some exceptions, those species with large wing area to body weight ratios, i.e. the more delicate species, tend to be caught more commonly inside the yew woodland than in the grassland. The reverse is true for the more robust species. These deductions are endorsed by the general comparison between delicate and robust moths (Table 4). One interpretation of these findings is that delicate, less strongly flying species may habitually seek shelter from the wind in dense woodland such as the yew woodland in this study. However, that is not to say avoidance of wind buffeting is the only factor producing the biases observed, and it is pertinent to consider each species, showing a significant bias to one habitat or the other, individually. This is done in Table 5 in which, for each of the relevant species, the type of habitat bias, whether they are classed as delicate or robust, their larval food plant, their roosting behaviour, and a tentative deduction of the principal factor influencing the habitat bias they show, is given.

In the majority of cases seemingly sensible reasons for the habitat preferences observed can be given. In some cases, such as *P. rhomboidaria*, *Deileptenia ribeata* and *A. repandata* it is probable that all three factors under consideration contribute to the behaviour. For the majority of the 'delicate' species, using the yew woodland as a sheltered flight corridor is probably the principal cause of the observations, and in many cases over-rides larval foodplant. There are three species which buck this trend. It is possible that in each of the three, *Cyclophora linearia*, *Colostygia pectinataria* and *Hydriomena furcata*, proximity to larval foodplants takes precedence. This is almost certain in the case of *C. linearia*, for it was taken most often in a trap

Table 5. The habitat bias, build, larval foodplant and roosting sites for each of the species showing a statistically significant habitat bias. The most important factor determining this bias is tentatively proposed for each species.

Species	Habitat bias	Build	Larval food	Roosting sites	Principal factor
<i>C. linearia</i>	G	D	Beech	Foliage	Fdpt.
<i>I. biselata</i>	Y	D	Various plants	Foliage	Sh. fl.
<i>I. versata</i>	Y	D	Various low plants	Foliage	Sh. fl.
<i>C. ocellata</i>	Y	D	Bedstraws	Foliage	Sh. fl.
<i>C. pectinataria</i>	G	D	Bedstraws	Foliage	? Fdpt.
<i>H. furcata</i>	G	D	Sallows, various bushes	Bark and foliage	? Fdpt.
<i>H. tersata</i>	Y	D	Traveller's joy	? Foliage	Sh. fl.
<i>S. liturata</i>	Y	D	Needled conifers	Bark, conifer foliage	Fdpt.
<i>O. luteolata</i>	Y	D	Various broad-leaf trees	Foliage	Sh. fl.
<i>O. sambucaria</i>	Y	D	Various trees, shrubs	Foliage	Sh. fl.
<i>P. rhomboidaria</i>	Y	D	Various trees inc. yew	Bark	Fdpt., roost, Sh. fl.
<i>D. ribeata</i>	Y	D	Various trees inc. yew	Bark	Fdpt., roost, Sh. fl.
<i>A. repandata</i>	Y	D	Various trees inc. yew	Bark	Fdpt., roost, Sh. fl.
<i>E. bistortata</i>	Y	D	Various broad-leaf trees	Bark	Roost, Sh. fl.
<i>C. pusaria</i>	Y	D	Various broad-leaf trees	Foliage	Sh. fl.
<i>C. exanthemata</i>	Y	D	Sallows, aspen	Foliage of foodplant	Sh. fl.
<i>C. margaritata</i>	Y	D	Various broad-leaf trees	Foliage	Sh. fl.
<i>H. fasciaria</i>	Y	D	Needled conifers	Bark, conifer foliage	Fdpt., roost, Sh. fl.
<i>A. clavis</i>	G	R	Various low plants	Low vegetation, litter	Fdpt., roost
<i>A. exclamacionis</i>	G	R	Various low plants	Low vegetation, litter	Fdpt., roost
<i>O. plecta</i>	Y	R	Various low plants	Low vegetation	?
<i>M. pallens</i>	G	R	Various grasses	Low vegetation	Fdpt., roost
<i>R. ferruginea</i>	G	R	Various low plants	Unknown	? Fdpt.
<i>A. sublustris</i>	G	R	? Various grasses	Low vegetation	Roost, ? Fdpt.
<i>Oligia</i> spp.	G	R	Various grasses	Bark, low vegetation	Fdpt.
<i>C. morpheus</i>	G	R	Low growing plants	Low vegetation, litter	Fdpt., roost
<i>L. pygarga</i>	G	R	Various grasses	Unknown	Fdpt.
<i>D. chrysitis</i>	G	R	Low growing plants	Low vegetation	Fdpt., roost
<i>A. pulchrina</i>	G	R	Various low plants	Vegetation	Fdpt., roost
<i>A. triplasia</i>	Y	R	Nettle	? Bark, foliage	? Roost
<i>R. sericealis</i>	G	?	Various grasses	Low vegetation	Fdpt., roost
<i>H. proboscidalis</i>	Y	D	Nettle	Bark, foliage, low vegetation	Sh. fl.
<i>P. strigilata</i>	Y	D	? Withered broad-leaf leaves	Bark, foliage	Sh. fl.
<i>H. nemoralis</i>	Y	D	Oak, alder	Bark foliage	Sh. fl.

Abbreviations: G grass, Y yew, D delicate, R robust, Fdpt. foodplant, Sh. fl. sheltered flight.

on the chalk grassland adjacent to a mature beech and larch plantation. For the other two species, although their larval foodplants grow closer to the grassland traps than the yew traps, the same could be said of many of the other 'delicate' species, and it is not so obvious why these two species buck the trend.

Among the robust species, the need for a sheltered flight corridor would not be expected to be an important factor contributing to flight behaviour. In these species, larval foodplants and roosting sites take precedence, and as none of the species feeds on yew, the expectation is that these species should be trapped most frequently in the grassland habitat. In the majority of cases where a bias is seen, this is the case, but again there are exceptions, both *Ochropleura plecta* and *Abrostola triplasia* apparently preferring the woodland habitat. In the latter species, finding a roosting site may be a contributing factor, but this suggestion is very tentative. For *O. plecta*, no convincing case can be made on the basis of any of the factors under consideration.

The results contained herein broadly endorse Waring's (1989) findings that many species of moth show habitat flight preferences. They suggest that for geometrid-like species, but not for the more robust noctuid-like species, dense woodland may provide a sheltered flight corridor, a factor alluded to by Waring in respect of *Idaea biselata* and *I. versata*. In the majority of cases, a sensible interpretation of the habitat biases seen, based on current knowledge of the species in question, can be made.

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BOOK REVIEW

The butterflies of Berkshire, Buckinghamshire and Oxfordshire by J. Asher. Newbury, Pisces Publications, 1994, viii + 136 pages, £18.95, hardback.—This beautifully illustrated atlas, presenting the results of one of the most intensive local butterfly surveys ever undertaken, will be welcomed by all ardent butterfly conservationists.

The foreword by the chairman of the Upper Thames branch of Butterfly Conservation is followed by acknowledgements and then the introduction. This has sections on what are butterflies?; life cycle of the butterfly; the key features of the three counties; and a detailed description of the origin and development of the national organization, Butterfly Conservation. As befits the planning and undertaking of such an intensive survey, which embodies over 90 000 sightings made by over 350 people, there is a full description of the Upper Thames butterfly atlas project.

The main part of the book (pages 17 to 102) consists of a description of each species, its behaviour and conservation status. Each species description is headed with a coloured flight season chart, the deepest colour thereon indicating when butterflies were seen in every year of the 1987–1992 survey, and a paler colour when they were seen in some years but not in others. Each species distribution map also has its tetrads colour coded, yellow indicating one record, brown, two to nine and red ten plus records. The work of processing all this data and the final production of the maps must have been enormous, but if the data only related to adult butterflies (as presumably such a time-consuming task must have done) without any allowance for larval numbers, a misleading picture can sometimes result. For example, red is not used on the map relating to that very local and elusive species, the brown hairstreak, yet, when this reviewer worked Hell Coppice in the early 1940s, it was not difficult to find 25 larvae of *betulae* upon the stunted little blackthorns, but only twice was the adult butterfly ever seen there! Much useful information is given relating to each of the 48 butterfly species known from the three counties, though when speaking of that currently absent species, the large tortoiseshell, this reviewer would not agree with the ending of Mr Asher's statement . . . 'while it is possible that it may stage a recovery from the continent, it is also increasingly uncommon there now, which makes the chances of a resurgence in numbers seem remote'.

The sections following the species descriptions are headed: sightings of unusual vagrant species; predators and parasites; managing habitats to conserve butterflies; and when and where to see butterflies. The management section is lengthy (pages 105 to 125) and, relating as it does to famous localities well known to this reviewer, made fascinating reading. When woodland management is being discussed Bernwood, long known nationally as an important place for butterflies, receives special mention. It would be appropriate to have included here a mention of the pioneering work of the late Dr Roger Clarke, formerly Oxfordshire County Secretary of BBONT who, in addition to organizing conservation tasks, collected eggs of purple emperors from the wild, bred them through to adult butterflies, and then delighted many visitors to his annual 'emperor releases'.

The final pages contain a glossary; species check list; check list of foodplants; bibliography; and conservation organizations. The atlas is well bound, clearly printed and, at £18.95, not unreasonably priced, when considering the high quality colour work therein. Jim Asher is to be congratulated, not only for his photographic skills, but for seeing his mammoth task through to completion. However, he has set a difficult precedent to follow for, as David Redhead says in his foreword 'this achievement should be seen only as the start . . . the recording effort must continue to enable an up-to-date picture to be kept available'.

ANTS FEEDING DIRECTLY ON PLANT SAP

RICHARD A. JONES

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In my small front garden, the large coltsfoot-shaped leaves of *Ligularia dentata* (Gray) Hara (Asteraceae, = formerly Compositae) became slightly damaged through being knocked by the wind against the adjacent garden wall. Some of the leaves showed small tears a few centimetres long, which quickly became browned along the ragged edges. The leaves of this large garden ragwort are tough and leathery, the damage was minor and the large yellow flowers were unharmed, so I ignored the insignificant cuts on a few of the leaves.

However, during several warm days in June, July and August 1993, I noticed that ants were congregating along the edges of these cuts. They were foraging workers of the extremely common 'pavement ant', *Lasius niger* (L.) and they appeared to be biting at the edges of the tears in the leaves. Each of several leaf abrasions had two or three ants, seeming to focus their attentions on particular points. Some of the longer tears (10 cm or so) had perhaps five or six ants both above and below the leaf surface, biting at particular points along the very edge of the leaf tear.

Examination of the leaf lacerations under a hand lens showed that when fresh, sap oozed from cut edges. A day later, a tear would be browned, and the sap appeared to have crystallized, giving the edge a glinting sugary appearance. The ants appeared to be feeding on this crystallized sap. It is possible that their feeding

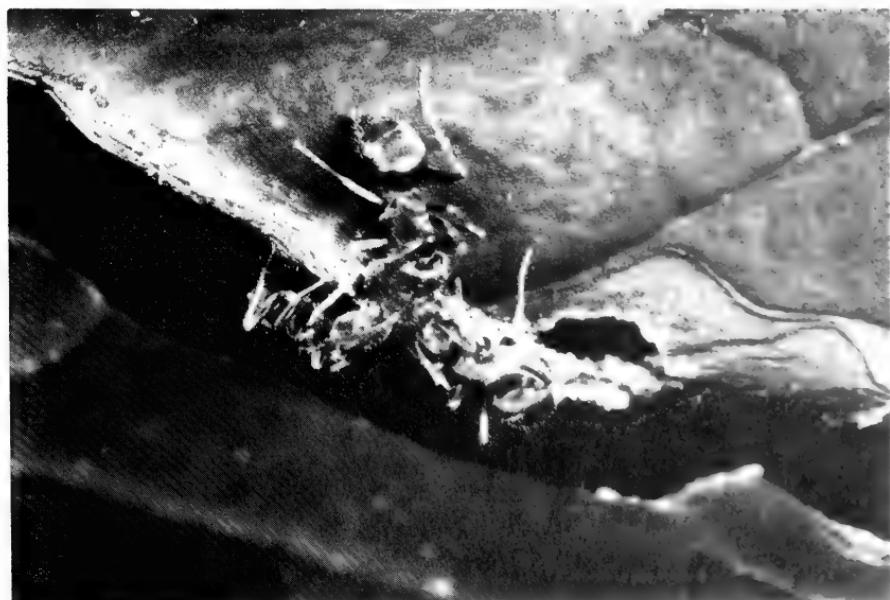


Fig. 1. Three ants (*Lasius niger*) intent on a particular spot along a tear in the leaf of *Ligularia dentata*, where they appear to be feeding on the crystallized sap of the plant. Photo: R. A. Jones.

points were associated with vein endings, as possibly shown in the photograph, and that they were feeding on flowing rather than crystallized sap.

That ants feed on plant secretions, in the form of nectar from flowers and extrafloral nectaries, is well known as is their indirect feeding on sap which has passed through the digestive tract of aphids and excreted in the form of honeydew (Kirby & Spence, 1818; Westwood, 1840; Brian, 1977; Collingwood, 1979; Gauld & Bolton, 1988). However, I am unable to find any reference to ants feeding directly on plant sap.

Mr A. J. Halstead informs me that there is a photograph in the archives of the R. H. S. Garden at Wisley showing an unnamed yellowish-brown ant damaging the leaf margins and petals of a glasshouse plant, *Cathyranthus roseus*, and he tells me that he has also seen large numbers of the ant *Lasius fuliginosus* (Latr.) nibbling the edge of flower petals on *Rosa 'Maigold'* at Wisley on 2.vii.1976. Interestingly, he found similar damage being caused to another specimen of this rose variety by the wasp *Vespa vulgaris* (L.) on 26.ix.1974, so it may have particularly sweet petals.

Ants are by no means unknown as herbivores (in the widest sense): in the New World, leaf-cutter ants (tribe Attini) eat the fungus that they culture on the cut leaves with which they stock their nests, and in the Old World, harvester ants (*Messor* spp.) feed on seeds. I am surprised, therefore, to find no reference to this behaviour anywhere in the literature, given that *Lasius niger* is so common a garden species and that horticulturalists are so aware of other minor pests on their plants.

ACKNOWLEDGEMENTS

I thank Mr A. J. Halstead for commenting on a draft of this paper and for allowing me to quote his very interesting observations.

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BOOK NOTICE

The bee genera of North and Central America (Hymenoptera: Apoidea) by C. D. Michener, R. J. McGinley and B. N. Danforth. Smithsonian Institution Press, Washington and London, 1994, viii + 210pp, £34.95 (\$53.95), hardback.—A highly illustrated book with bilingual (English and Spanish) text comprising mainly diagnostic keys and short descriptions. Generic check list and extensive references complete this very thorough taxonomic study. It is a shame that more biological and ecological details are not given.

EDITORIAL

LONG SERIES NOT WELCOME

Members will have noticed that for some years the following statement has appeared on the Society's Annual Exhibition Notice:

Long series of rare or endangered insects will not be welcome.

The idea that entomologists are like stamp collectors, displaying drawer after drawer of pristine specimens as if striving for a complete set, is not a notion which we, as modern naturalists, enjoy. The common misconception that entomologists are mindless collectors is an impression we should not be encouraging.

For the 1993 notice another sentence was added:

Long series of any insect taken from the same locality will not be welcome.

For the sake of saving embarrassment to individual members and to the Society, the Council has discussed what its policy should be with regard to exhibits of "threatened" or "scarce" insects, and exactly how long a long series is.

The Annual Exhibition is the Society's largest, most popular, and most public event. We must be aware not only of the opportunity it gives for the Society to advertise its work, but also the opportunity it gives to everyone to scrutinize the Society's activities.

Today the Society enjoys a reputation as Britain's foremost field entomological society. Its voice is heard in governmental and non-governmental organizations through its contacts with Wildlife Link. Its opinions are sought out by national and local conservation groups. Its members are widely active throughout the country in a variety of special interest groups and recording schemes. The Society must anticipate and counter any disquiet, real or imagined, felt by the general public who may view collecting with anything from mild interest and humorous derision to suspicion and outright disgust.

The need for collecting insects is not in doubt, the arguments in its favour are forceful and well-founded. For the majority of insects, collecting is necessary to ensure correct identification. Frequently, a reference collection is the only means of achieving this correct identification. Surveys require the retention of voucher specimens. Collecting can harm only a handful of recognized and nominated species regarded as being exceptionally vulnerable.

What is at issue is the image of the BENHS, an image which we should seek to sustain as a society of concerned and responsible entomologists who demonstrate respect for nature and respect for conservation.

How rare is rare?

In current jargon "rare" means having red data book (RDB) status. RDB3 is officially designated as "rare", and since RDB2 ("vulnerable") and RDB1 ("endangered") are even rarer than "rare" they too must be included in a general definition. A list of RDB1, 2 and 3 macrolepidoptera is appended below.

How long is long?

The "code for insect collecting", first drawn up by the Joint Committee for the Conservation of British Insects (now Invertebrates), JCCBI, in 1972 is fully endorsed by the BENHS. It has been widely publicized, and appears in the insect volume of *British red data books* and elsewhere. The appropriate section on collecting rare and endangered macrolepidoptera species (paragraph 2.1) states "As a guide the Committee suggests that a pair of specimens is sufficient, but those species in the greatest danger should not be collected at all". The code specifies macrolepidoptera in this context, however collectors of all orders might like to consider how such restraint could apply more broadly.

The code also suggests (paragraph 1.3) "The same species should not be taken in numbers year after year from the same locality". There is sometimes a good and valid argument for collecting more of certain species, from the same locality, over a number of years. Analysis of regional variation, genetic forms, population studies and the like can only be carried out by collection and examination of numerous specimens. The killing of captive-bred specimens further clouds the issue, as the habitat and environment are obviously not affected.

In these cases the length of a series is analogous to the length of a piece of string. Entomologists must act by their own restraint. However, to avert confusion and embarrassment, Council suggests that as a general "rule of thumb", six specimens ought to be enough to demonstrate in an exhibit a particular local form or variety or variation spectrum. If it is thought that more than this number are required in an exhibit, Council is pleased to be approached by potential exhibitors.

Breaking new ground

Another source of possible disquiet follows the discovery of a rare insect in a novel locality. It duly appears in an exhibit one year only to appear in several exhibits the next—all from that same locality. Some entomologists have been encouraged to keep important records secret for fear of a new locality being over-run by collectors! This needlessly continues to fuel the fire of concern amongst the anti-collecting fraternity.

Annual Exhibition

It is not possible, or indeed desirable, for the Society to police its members' collecting habits. However, it is desirable to support a vision of the BENHS as a society of responsible and sensible naturalists in pursuit of a laudable and important aim—the furtherance of entomological knowledge.

Members will not, therefore, be surprised to find the following announcement given full prominence on the Society's 1994 Annual Exhibition notice:

*Long series of threatened or scarce insects
will not be welcome. The code for insect collecting,
endorsed by the BENHS, suggests that a pair of
specimens of such species is sufficient.
Similarly, long series of any insect taken
from the same locality will not be welcome
without prior approach to the Council.*

APPENDIX. BRITISH RED DATA BOOK MACRO-MOTHS (REVISED DECEMBER 1993)
 (from Waring, in prep.)

Reed leopard
Phragmataecia castaneae, RDB2

Scotch burnet
Zygaena exulans subochracea, RDB3&5

Slender Scotch burnet
Zygaena loti scotica, RDB3&5

New Forest burnet
Zygaena viciae argyllensis, RDB1

Talisker narrow-bordered five spot burnet
Zygaena lonicerae jocelynae, RDB3

Transparent burnet
Zygaena purpuralis segontii, RDB1

Triangle
Heterogaea asella, RDB3

Welsh clearwing
Synanthedon scoliaeformis, RDB3

Fiery clearwing
Bembecia chrysidiiformis, RDB1

Ground lackey
Malacosoma castrensis, RDB3

Scarce hook-tip
Sabria harpagula, RDB3

Rest harrow
Aplasta ononaria, RDB3

Essex emerald
Thetidia smaragdaria maritima, RDB1&5

Sussex emerald
Thalera fimbrialis, RDB1

Dingy mocha
Cyclophora pendularia, RDB3

Sub-angled wave
Scopula nigropunctata, RDB2

Tawny wave
Scopula rubiginata, RDB3

Bright wave
Idaea ochrata cantiana, RDB2

Silky wave
Idaea dilutaria, RDB3

Portland ribbon wave
Idaea degeneraria, RDB3

Netted carpet
Eustroma reticulata, RDB2

Slender-striped rufous
Coenocalpe lapidata, RDB3

Barberry carpet
Pareulype berberata, RDB1

Pauper pug
Eupithecia egenaria, RDB3

Goosefoot pug
Eupithecia sinuosaria, RDBK

Scarce pug
Eupithecia extensaria occidua, RDB3

Grey carpet
Lithostege griseata, RDB3

Netted mountain moth
Semiothisa carbonaria, RDB3

Dark bordered beauty
Epione paralellaria, RDB3

Belted beauty
Lycia zonaria britannica, RDB3

Black-veined moth
Siona lineata, RDB1

Straw belle
Aspitates gilvaria gilvaria, RDB3

Scarce chocolate-tip
Closteria anachoreta, RDB1

Scarce vapourer
Orgyia recens, RDB3

Dotted footman
Pelosia muscerda, RDB3

Small dotted footman
Pelosia obtusa, RDB2

Pigmy footman
Eilema pygmaeola pygmaeola, RDB3

Pigmy footman
Eilema pygmaeola pallifrons, RDB1

Northern footman
Eilema sericea, RDB2

Speckled footman
Coscinia cribraria bivittata, RDB2

Rosy marsh moth
Eugrapha subrosea, RDB2

Cousin German
Paradiarsia sobrina, RDB3

Northern dart
Xestia alpicola alpina, Na (?RDB3)

Broad-bordered white underwing
Anarta melanopa, RDB3

Viper's bugloss
Hadena irregularis,
RDB1 (?extinct 1978)

White spot
Hadena albimacula, RDB2

Grey
Hadena caesia mananii, RDB3

Silurian
Eriopygodes imbecilla, RDB2

Cudweed
Cucullia gnaphalii occidentalis,
RDB1/?extinct

Toadflax brocade
Calophasia lunula, RDB3

Beautiful gothic
Leucochlaena oditis, RDB3

Rannoch sprawler
Brachionycha nubeculosa, RDB3

Orange upperwing
Jodia croceago, RDB2

Southern chestnut
Agrochola haematidea, RDBK

Scarce merveille du jour
Moma alpium, RDB3

Heart moth
Dicycla oo, RDB3

White-spotted pinion
Cosmia diffinis, Na/RDB3

The exile
Apamea zeta marmorata, Na/?RDB3

Least minor
Photedes captiuncula, RDB3/?Na

Morris's wainscot
Photedes morrisii morrisii, RDB1

Bond's wainscot
Photedes morrisii bondii, RDB1/?extinct

Concolorous
Photedes extrema, RDB3

Fenn's wainscot
Photedes brevilinea, RDB3

Sandhill rustic
Luperina nickerlii nickerlii, Na

Sandhill rustic
Luperina nickerlii leechi, RDB1

Sandhill rustic
Luperina nickerlii gueneei, RDB2

Marsh mallow moth
Hydraecia osseola hucherardi, RDB1

Fisher's estuarine moth
Gortyna borelii lunata, RDB2

Rush wainscot
*Archana alga*e, RDB3

White-mantled wainscot
Archana neurica, RDB3

Marsh moth
Athetis pallustris, RDB3

Reddish buff
Acosmetia caliginosa, RDB1

Marbled clover
Heliothis viriplaca, RDB3

Shoulder-striped clover
*Heliothis maritima warnecke*i, RDB3

Silver barred
Deltote bankiana, RDB3

Light crimson underwing
Catocala promissa, RDB3

Dark crimson underwing
Catocala sponsa, RDB2

Four-spotted
Tyta luctuosa, RDB3, even Na

Scarce blackneck
Lygephila craccae, RDB3

Lesser belle
Colobochyla salicalis, RDB1/?extinct

Bloxworth snout
Hypena obsitalis, RDBK

Autumnal snout
Schranksia intermedialis, RDBK

Shaded fan-foot
Herminia tarsicrinalis, RDB3

Olive crescent
Trisateles emortualis, RDB3

RDB Macro-moths considered extinct as residents:

New Forest burnet
Zygaena viciae ytenensis, Extinct

Small lappet
Phyllodesma ilicifolia, ?Extinct

Lewes wave
Scopula immorata, Extinct

Ochraceous wave
Idaea serpentata, Extinct

Isle of Wight wave
Idaea humiliata, ?Extinct

Many-lined
Costaconvexa polygrammata, Extinct

Frosted yellow
Isturgia limbaria, Extinct

Speckled beauty
Fagivorina arenaria, Extinct

White prominent
Leucodonta bicoloria, Extinct

Gypsy moth
Lymantria dispar, Extinct/Migrant

Scarce black arches
Nola aerugula, Extinct/Migrant

Feathered ear
Pachetra sagittigera britannica, Extinct

Small ranunculus
Hecatera dysodea, Extinct

Conformist
Lithophane furcifera suffusa, ?Extinct

Marsh dagger
Acronicta strigosa, Extinct

Blair's wainscot
Sedina buettneri, ?Extinct/Migrant

Spotted sulphur
Emmelia trabealis, Extinct

Macro-moths which would qualify for RDB status if the larval foodplants were not alien to Britain:

Cloaked pug
Eupithecia abietaria, Uncommon/alien foodplant

Feathered beauty
Peribatodes secundaria, Uncommon/alien foodplant

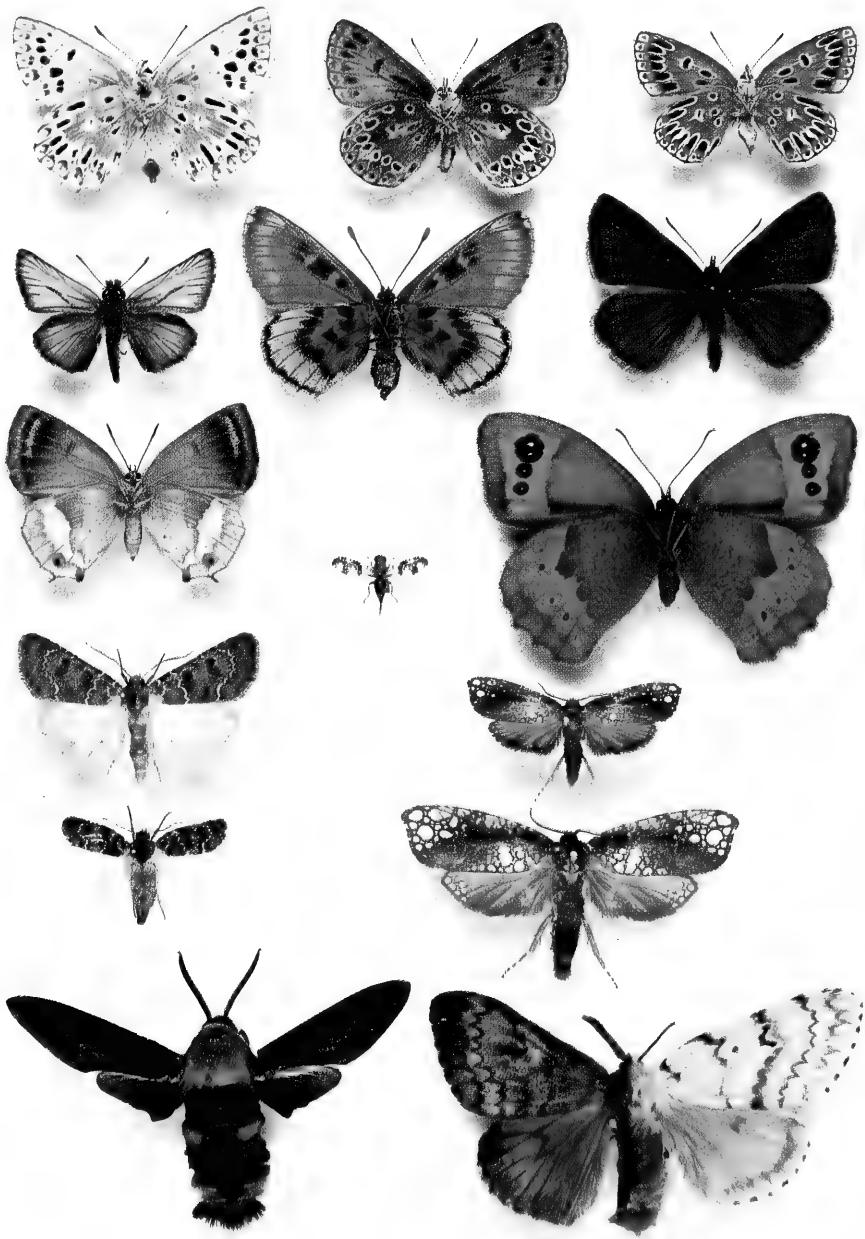


Plate I. ANNUAL EXHIBITION 1993

1993 ANNUAL EXHIBITION
Imperial College, London SW7—30 October 1993

The following account of exhibits has been compiled by R. D. G. Barrington (British Butterflies), B. K. West (British Macrolepidoptera), J. M. Chalmers-Hunt (British Microlepidoptera), B. Goater (Foreign Lepidoptera), P. J. Chandler (Diptera), P. J. Hodge (Coleoptera), P. Kirby (Hemiptera), A. J. Halstead (Hymenoptera and other orders) and R. Dyke (Illustrations). The photographs for the two colour plates were taken by D. E. Wilson.

BRITISH BUTTERFLIES

BAILEY, K. E. J.—(1) A series of *Pararge aegeria* L. ab. *cockaynei* Goodson with heavily smudged markings, bred in i-ii.1993, included some extreme forms. This aberration has an environmental rather than genetic basis, occurring when overwintering larvae complete their development early. An example of the aberration was illustrated in *Br. J. Ent. Nat. Hist.* 1991; 4: Plate I. A range of aberrations from the exhibitor's continuing work with the effects of temperature and photoperiod shocks to late larvae and early pupae. Included were extreme melanic forms of *Polygonia c-album* L. ab. *reichstettensis* Fetting, *Aglais urticae* L. ab. *semiichneusoides* Pronin, *Vanessa atalanta* L. ab. *klemensiewiczi* Schille and *Nymphalis polychloros* L. ab. *testudo* Esper. One specimen of *testudo* was of a very unusual form with greatly reduced dark markings. Minor forms of *Argynnis adippe* D. & S. had the hindwing marginal spots confluent (extreme cold of -14°C was required at the pupal stage to induce this variation).

A wild-caught *Boloria selene* D. & S. ab. *pittionii* Nitsche from which ova were obtained, and a captured aberration of *Boloria euphrosyne* L. with confluent hindwings. After years of trying, Mr Bailey has succeeded in producing aberrations of *B. euphrosyne*. These occurred when the larvae were photoperiod-stressed, and the pupae were then cold-shocked. One specimen was an extreme form with the underside obsolete and with heavy silver markings.

(2) A quite beautiful series of extreme forms of *Eurodryas aurinia* Rott. ab. *sebaldus* Schultz (Plate I, Fig. 5). These were the result of cold-shocked pupae that were bred

Plate I. ANNUAL EXHIBITION 1993

1	2	3
4	5	6
7	8	9
10	12	
11	13	
14	15	

1: *Lysandra coridon* ab. *discreta-postradiata*, Dorset, 30.vii.1993, S. J. Rook. 2: *Polyommatus icarus* melanic underside, bred, 1993, L. D. Young. 3: *Polyommatus icarus* ab. *radiata*, bred, R. Revels. 4: *Thymelicus sylvestris* ab. *intermedia*, 7.vii.1992, M. Callow. 5: *Eurodryas aurinia* ab. *sebaldus*, bred (cold shock), K. E. J. Bailey. 6: *Polyommatus icarus* melanic ab., Isle of Skye, 27.vi.1993, W. G. Tremewan. 7: *Quercusia quercus* ab. *latefasciata*, bred, 27.vi.1993, A. M. Jones. 8: *Acinia corniculata*, Chailey Common, 19.viii.1993, P. J. Hodge. 9: *Maniola jurtina* ab. *excessa*, bred, Dorset, 1993, R. D. G. Barrington. 10 & 11: *Victrix agenjoi*, Valladolid, Spain, B. Goater; 10 male, 11 female. 12 & 13: New dudgeonid species, Borneo, G. Ping & G. S. Robinson; 12 male, 13 female. 14: *Sataspes infernalis*, Hong Kong, 1993, P. Waring. 15: *Lymantria dispar*, bilateral gynandromorph, bred US Dept. Agric., R. D. G. Barrington.

Photo: D. E. Wilson

from aberrant parents also produced from cold-shocked pupae. The present brood contained specimens considerably more aberrant than the parents (perhaps suggesting that selection for a strain more receptive to cold-shocks is possible). They compared with some very extreme wild-captured forms from Devon in the 1940s, illustrated in the *Colour identification guide to butterflies of the British Isles*, Viking, 1973.

BARRINGTON, R. D. G.—Two generations from a female *Maniola jurtina* L. ab. *excessa* Leeds taken in Dorset, vii.1991. The original parent had two strong extra black spots on each forewing below the apical spot. The F₁ of 31 insects was a graded series from type to good examples of *excessa*. The F₂ generation (from F₁ *excessa* parents) of 19 insects was again graded from type through to an extreme female example of *excessa* having two very heavy extra pupilled spots on each forewing, and a spot at the anal angle of the upperside hindwing (Plate I, Fig. 9). This is a multifactorial/polygenic form (i.e. controlled by a number of genes having an additive effect). Wild-captured aberrations included a male *Lysandra coridon* Poda ab. *ultrafowleri-margino* B.&L., *Thymelicus sylvestris* Poda ab. *pallida* Tutt, (a female with white ground colour) and a female *Anthocharis cardamines* L. with a streaked discal spot.

CALLOW M. A pair of *Argynnis paphia* L. ab. *confluens* Spuler (2 and 3.vii.1993) and two extremes of *Ladoga camilla* L. ab. *obliterae* Robson & Gardner (vi/vii.1993). A strongly marked male *Lysandra coridon* Poda ab. *striata* Tutt (Dorset, 1993) with a single streak from a submarginal spot through the discoidal spot to the basal spot on each forewing. A good male *T. sylvestris* ab. *intermedia* Frohawk (Plate I, Fig. 4) with yellow-white groundcolour taken on 7.vii.1992 from among many hundreds observed.

DENNIS, R. C.—A breeding experiment with *Pyronia tithonus* L. from an original parent transitional to ab. *caeca* Tutt (an example of *caeca* taken by the exhibitor was illustrated in *Br. J. Ent. Nat. Hist.* 1991; 4: Plate I). The F₁ of 4 females and 39 males contained 22% aberrations. The F₂ of 15 females and 23 males contained 51% aberrations. It is probable that this is a dominant form, although the ratios of aberrations to type (the original parent being assumed to be heterozygous) fell short of the expected (which would be 50% aberrations and 75% aberrations in the F₁ and F₂ respectively). However, it is likely, given the shortage of females in both broods, that the gene has a weakening effect, hence the reduced percentages of aberrations.

Also shown were a female *Melanargia galathea* L. with a black patch on the right forewing (and deformed venation in this area), most likely caused by damage to the pupa or disease, and a female with reduced and pale markings. Two females of *Lysandra coridon* with darkened undersides and a male showing both ab. *ultrafowleri* South and ab. *caeca* Courv. Two bleached specimens of *M. jurtina* and a female example with the forewing fulvous very pale on the underside.

JONES, A. M.—A pair of melanic aberrations of *Argynnis paphia*, the male ab. *confluens* Spuler and the female a very dark ab. *ocellata* Frings. Two extreme *L. camilla* L. ab. *nigrina* Weymer and an example of the less extreme ab. *obliterae* Robson and Gardner. All of these insects were in perfect condition. The exhibitor, having noticed *camilla* pupating in the wild at a time of hot weather in early June 1993, was encouraged to search for melanic forms of both species during the flight period, with subsequent success. A fine and extreme aberration of *Quercusia quercus* L., a female bred from wild ova. The underside hindwings were ab. *latefasciata* Courv. (Plate I, Fig. 7) with broad white banding, and the dark forewings were tending towards ab. *infraobscura* Goodson. A bred gynandromorph of *Anthocharis cardamines* L. with orange on the underside of the forewings of an otherwise entirely female insect. A bred example of *Pararge aegeria* L. ab. *cockaynei* Goodson, iii.1993.

PORTER, J.—*Pieris napi* L. ab. *obsoleta* Rober (lacking dark markings) and a dark female from the Scottish Highlands. *Inachis io* L. ab. *brunnea* Reuss bred from a brood of 100 adults. A good *L. camilla* ab. *nigrina*.

Plebejus argus L. from five different colonies including the chalk soil of Portland, Dorset (pale undersides and thin black borders on the upperside of the males), Greal Orme, North Wales (the famous ssp. *caernensis* Thompson) and from heathland, including an intersex, ab. *inaequalis* Cockayne—a female insect with strong blue scaling on the right wings. A female *Pyronia tithonus* L. ab. *crassieuxcessa* Leeds. *Coenonympha tullia* Müll. ssp. *scotica* Staud abs *pallida* Osthelder and *obsoleta* Tutt (entirely lacking spots). Two female *Polyommatus icarus* Rott, one an extreme ab. *coerulea* Fuchs from the North Downs, the other a Scottish female example with bright whitish-blue hindwing margins.

REVELS, R. C.—(1) A female example of *Pararge aegeria* ab. *saturatior* Cromb. from Herts., 1993, lacking pale markings on the hindwings and reduced on the forewings. A very remarkable male *Colias croceus* Geoff. aberration bred by a colleague from purchased pupae. The right forewing is completely melanic on both surfaces (but with the original pattern visible) and the upper third of the right hindwing is melanic on the underside only (figured in *Bull. Amat. Entomologists' Soc.* 1993; 52: pl.T). A male *P. icarus* ab. *radiata* Courv. bred in the F_2 from a similar original parent. Little else of note has appeared in the strain up to an F_3 of 150+ insects.

(2) A very impressive breeding experiment with *Polyommatus icarus* from an original parent ab. *discoelongata* B.&L. taken viii.1992 from a locality where ab. *radiata* has occurred. The F_1 of 40 insects was mostly typical although a few specimens were *discoelongata* on the forewings, and, in one male example, on all wings. This male was paired with a *discoelongata* female producing an F_2 of 24 males and 26 females in vii/viii.1993; 5 males and 9 females were *radiata* on all wings and another 5 of each sex were transitional forms. The remainder of the brood was typical or nearly so. Pairings between *radiata* adults produced an F_3 of 91 insects in ix.1993. This contained a graded range of aberrations from type (3 of each sex), through transitional forms (20 insects) to full *radiata* (Plate I, Fig. 3) (30 males and 35 females). Ova have been obtained to continue the strain.

Breeding over many years by L. D. Young has shown that *discoelongata* is inherited as a multifactorial/polygenic form and when inbred can produce *radiata*. The present strain required many fewer generations to produce full *radiata*, and continued inbreeding by the exhibitor will hopefully indicate whether a different gene system is in operation.

(3) F_1 and F_2 broods from an extreme aberration of *Pyronia tithonus* L. with very broad forewing borders and lacking the hindwing fulvous. This experiment has shown this to be a dominant form with a weakening effect on the insects. This aberration was figured in *Proc. Trans. Br. Ent. Nat. Hist. Soc.* 1985; 18: Plate 1.

ROBERTSON, T. S.—An unusual form of *Aglais urticae* L. Finchampstead, Berks., 24.viii.1993, with the basal two forewing costal black markings joined. Usually in aberrant *urticae* it is the sub-basal and distal costal markings that coalesce.

ROOK, S. J.—Two aberrations of *Lysandra coridon* Poda from Dorset in 1993. One was ab. *discreta-postradiata* B.&L. (Plate I, Fig. 1), the second a female with strong blue scaling on the upperside of all wings, bearing similarities to ab. *semisyrapha* Tutt.

RUSSWURM, A. D. A. & MIDDLETON, H. G. M.—A female *Maniola jurtina* L. with very bright markings and an enlarged apical spot, having the appearance of an extreme form of ssp. *cassiteridum* Graves (Scilly Isles), from Boldre, Hants. 3.viii.1993.

TEBBUT, P.—A range of aberrations of *Aphantopus hyperantus* L. showing variation in spotting from ab. *arete* Muller to ab. *lanceolata* Shipp, and an unusual female underside aberration with whitish scaling extending distally from all spots. *Pyronia tithonus* L., males abs. *antipallidula* Leeds and *antiparvipuncta* Leeds. Two bred *M. jurtina* L. were shown. One was a male ab. *commaculo* Leeds (ground colour on the upperside marbled and pale markings—a scale defect) and a female ab. *pauper* Verity (with reduced upperside fulvous). *Aricia agestis* D. & S. ab. *pallidior* Ober (pale lunules). Two female aberrations of *Pieris napi*, one being ab. *fasciata* Tutt and *nigropunctata* Lamb. and the other ab. *deleta* Strand and *unimacula* Dziursynski (reduced markings).

TREMEWAN, W. G.—A fine aberration of *P. icarus* Rott. (Plate I, Fig. 6), from the Isle of Skye (27.vi.1993). This was an extreme melanic male on both surfaces, bearing a resemblance to the melanic male *L. coridon* exhibited at the 1992 Exhibition by G. D. Trebilcock and illustrated in *Br. J. Ent. Nat. Hist.* 1993; 6: Plate II (although this *coridon* form was a mosaic with type coloration also).

TUBBS, R. S.—A drawer of aberrations of *P. tithonus* including a fine series of ab. *mincki* Seibold (ground colour yellow-white) bred in the F_2 from an original *mincki* parent taken in Wilts by R. C. Revels in 1981. It proved to be a recessive form. Five F_2 specimens of the very dark aberration also exhibited by R. C. Revels, and bred from ova supplied by him. Fifteen specimens of ab. *excessa* Leeds (extra forewing spotting) from Minehead, 1952. R. C. Revels has shown this to be a multifactorial/polygenic form as is the corresponding form in *M. jurtina*, as illustrated in the exhibit of R. D. G. Barrington.

WARNE, B. J.—A male *Maniola jurtina* L. ab. *partimtransformis* Leeds having the left side strongly bleached (I.o.W., 23.vi.1993) and a female *Q. quercus* taken at m.v. light (I.o.W., 18.vii.1993).

WINOKUR, L.—A large exhibit of breeding experiments with *Pararge aegeria* L. carried out at Reading University, funded by the Natural Environmental Research Council (UK).

(1) Breeding experiments showed an increase in wing size from south to north (using stocks from Salisbury, Wilts. (spp. *tircis* Godart), North Wales (spp. *tircis*) and N-W Scotland (ssp. *oblita* Harrison)) when stock was reared under similar conditions. Within each population, stock reared at lower temperatures produced larger adults.

(2) An aberration from two North Wales localities with an extra forewing ocellus in space 2. It is a recessive form.

(3) Breeding experiments involving colour forms similar to ab. *cockaynei*. One conclusion was that this form can be produced artificially either by changes in daylength or in temperature.

YOUNG M.—*Lycaena phlaeas* L. ab. *alba* Tutt (Rossie Moor, Angus, 4.vii.1993—donated to the exhibitor by Dr John Langmaid).

YOUNG, L. D.—A fine display of aberrations of *Polyommatus icarus* Rott. being a condensed version of the huge breeding experiment with abs *discoelongata* B.&L. and *basielongata* B.&L., the yearly results of which have been displayed at the Annual Exhibition since 1985. The present exhibit showed four specimens from each generation after the two aberrations were crossed in 1986. The development through to ab. *antiradiata* with enlarged hindwing spots in the later generations could be seen very clearly. The abs *retrojuncta* B.&L. and *limbojuncta* Courv. have appeared at random throughout the experiment. Also shown was a group of the most extreme female upperside forms that have occurred, including some striking blue aberrations. Nine specimens were shown from the last year's breeding, including some very good

antiradiata with elongated hindwing spots, and a rare underside melanic form of the male (Plate I, Fig. 2).

BRITISH MACROLEPIDOPTERA

AGASSIZ, D. J. L.—On behalf of J. Hale the second *Athetis hospes* Freyer (Plate II, Fig. 4) for the British Isles, from St Agnes, Isles of Scilly, 14.ix.1993.

ALEXANDER, K. & FOSTER, A.—From Dolmelynlyn Woods, Mer.: *Venusia cambrica* Curt. and *Lampropteryx otregiata* Metcalf; from Cregennen Bog, Mer.: *Xylena vetusta* Hübn. bred from larva found on *Myrica gale* L.

BAKER, P.—*Pseudopanthera macularia* L. ab. with greatly reduced maculation (Plate II, Fig. 15), Virginia Water, Surrey, 12.v.1993; *Euproctis similis* Fuess., with submarginal spotting, Thorpe, Surrey, 13.vii.1990; *Eupithecia virgaureata* Doubl., Lizard, Cornwall, bred from larvae found commonly on ragwort, but scarce on *Solidago*; a dark banded *Crocallis elinguaria* L., Thorpe, 22.vii.1993 and *Thera obeliscata* Hübn. with a diffuse median fascia and inner margin of reddish colour, Thorpe, 9.v.1993.

BROTHERIDGE, D.—Exhibit included species rare in Wiltshire—*Lampropteryx otregiata* Metc., *Idaea vulpinaria* H.-S., *Amphipoea fucosa* Freyer, *Chloroclysta siterata* Hufn., *Moma alpium* Osb., *Coenobia rufa* Haw., *Heliothis armigera* Hübn., *H. viriplaca* Hufn. and *Trichoplusia ni* Hübn.

CLANCY, S.—Migrants taken at Dungeness, Kent, in 1993 included the second British record of *Harpyia milhauseri* F. 24.v.; *Hyles euphorbiae* L., 12.viii; *Nola aerugula* Hübn., 2.vii; *Photedes extrema* Hübn., the second and third county records, 1.vi and 10.vi; *Ochropleura leucogaster* Freyer, the fourth British record, 11.x.; *Agrotis trux* Hübn., first county record, 10.ix.; *Trigonophora flammearia* Esp. 12.x.; *Macdunnoughia confusa* Steph., 21.ix.; and *Chrysodeixis chalcites* Esp. with enlarged gamma mark (Plate II, Fig. 8), 19.viii. Aberrations from Dungeness in 1993 included an albino *Tyria jacobaeae* L.; *Hadena perplexa* D. & S. with strong ante- and post-median lines (Plate II, Fig. 10), 30.iv.; *Xanthorhoe montanata* D. & S. with reduced dark scaling on one forewing, 6.vi. From elsewhere, *Euproctis similis* Fuess. with increased black markings on forewings (Plate II, Fig. 9), Tilshead, Wilts., 29.vii; *Ematurga atomaria* L. with reduced markings, Ashdown Forest, Sussex, 22.v.; a dark female *Lasiocampa quercus* L. Hamstreet, Kent, 3.vii; an extreme melanic *Acronicta alni* L., Beckley, Sussex, 12.v.; a richly coloured *Cosmia trapezina* L. ab. *rufa* Tutt from Hamstreet, 14.vii., and from the same locality two bred *Colocasia coryli* L. without the basal dark area.

CLARKE, C. M.—About 13 000 back-cross larvae of *Callimorpha dominula* L. (*medionigra* Cockayne × typical) were introduced from Cothill, Oxon. to the Wirral Way, Merseyside in 1961. The colony was rediscovered in June 1988 when a male *bimacula* Cockayne came to m.v. light, since when the colony has been studied, during which time the proportions of the three forms—typical, *medionigra* and *bimacula*—have remained in Hardy-Weinberg equilibrium with *medionigra* between 20 and 25%. This contrasts with Cothill where this form is now only about 2%. Two sets of imagines were exhibited, the first (1989) bred from last instar larvae from the Wirral Way, together with broods using these as parents, the second imagines bred from 1993 last instar larvae from the Wirral Way.

CLARKE, J. M.—The exhibit included specimens taken or bred in 1993: *Cossus cossus* L., larvae found in birch, but reared on beetroot; bred *Bembecia chrysidiiformis* Esp. and bred from birch *Synanthedon spheciiformis* D. & S., Bartley Heath, Hants; an unusually pale female *Macrothylacia rubi* L. from Hoads Wood, Kent; a bred

Lasiocampa quercus callunae Palmer ab. *olivacea* Tutt, Grantown-on-Spey, Moray; bred *Xestia rhomboidea* Esp. from Levisham, Yorks.; *Lomaspilis marginata* L. with brownish suffusion, Lingfield, Surrey; *Diarsia mendica* F. with enlarged and joined stigmata, East Grinstead, Sussex, and *Lycia zonaria* D. & S. from larvae found on Iona.

COLENUTT, S.—From Chale Green, I.o.W., *Lymantria dispar* L., 4.ix.1993 and a very dark *Agrotis clavis* Hufn.

COLLINS, G.—Series of *Eilema complana* L. from Surrey and Suffolk, and *E. sericea* Gregson from Shropshire for comparison; also other species of footman to show variation, including *E. griseola* Hübn and f. *stramineola* Doubl.; *E. deplana* Esp. ab. *plumbea* Cockayne; *Miltochrista miniata* Forst. ab. *flava* Bigneau; *Cybosia mesomella* L. ab. *flava* de Graaf.

COOK, R.—Included were bred series of *Hypena obsitalis* Hübn., Torbay, 1993; *Paradarisa consonaria* Hübn. ab. *waiensis* Richardson, a bred series from Cinderford, Forest of Dean; *Lycia zonaria* D. & S. bred from Iona, and *Synanthedon scoliaeformis* Borkh. bred from Rannoch, Perthshire, 1993.

CORLEY, M.—From Bladon Heath, Oxon. 22.vii.1993 *Eupithecia expallidata* Doubl., a new county record; *Solidago* is absent from the site, but *Senecio jacobaea* L. plentiful. *Amphipyra berbera* Rungs, a curious ab. lacking the copper colour on hindwings, 22.vii.1993.

DYER, J.—*Noctua janthe* Borkh. from Britain and Spain, and *N. janthina* D. & S. from Cyprus and Spain for comparison.

ELLIOTT, B.—1993 specimens included a bred series of *Agrochola haematidea* Dup. from Sussex; *Hypena obsitalis* Hübn. from S. Devon; *Acronicta euphorbiae myricae* Guen. from Co. Galway; *Hadena caesia mananii* Gregson from Co. Clare; *Euphyia biangulata* Haw. from Dorset; *Eupithecia fraxinata* Crewe from Derbyshire and *Eumichtis lichenea scillonea* Richardson from the Scilly Isles.

FORDER, P.—*Odontognophos dumetata* Treits., the original two specimens of subspecies *hibernica* Forder taken in Co. Clare, vii.1991 (Plate II, Fig. 12). Photographs of the moth in natural surroundings showed how well camouflaged it is when resting on the local limestone. Colour photographs of continental specimens, which are brown, not grey, were also exhibited.

HACKETT, D.—*Synanthedon vespiformis* (L.) reared from oak bark samples taken 5.v.1993. Queen's Woods, N. London, em. 16.vii.1993.

HALL, N.—Specimens of *Euxoa tritici* L. from Dorset which had been investigated to determine if any of them were *E. crypta* Dadd, a species with a known range from Spain to Finland, but without positive conclusion.

HART, C.—From Buckland, Surrey, rarities included *Scotopteryx rubidata* D. & S., 29.vi.1992; *Chloroclysta siterata* Hufn., 27.ix.1992 and 27.x.1993; *Chesias rufata* F., 24.iv.1993; *Xestia rhomboidea* Esp., 19.viii.92; *Abrostola trigemina* Werneb., 22.vi.93; *Macdunnoughia confusa* Steph., 20.viii.92, and *Hepialus fusconebulosa* de Geer, 8.vi.1993. From elsewhere moths included *Orthonama obstipata* F., Gunwalloe, Cornwall, 14.ix.1993; *Mythimna loreyi* Dup. and *Trichoplusia ni* Hübn. from St Keverne, Cornwall, 17.ix.1992.

HAYWARD, R.—*Agrotis trux lunigera* Steph., Slough, 18.vii.1992, a most unusual record for so far inland. A female *Diaphora mendica* Clerck taken at m.v. light, Slough, 7.v.1993. At Slough, and other places to the immediate west of London some species are darker than usual. From Slough the following species were shown to illustrate this—*Cyclophora punctaria* L., *Idaea seriata* Schr., *Hydriomena impluviata* D. & S., *Eupithecia assimilata* Doubl., *Menophra abruptaria* Thunb., *Peribatodes rhomboidaria* D. & S. ab. *perfumaria* Newman, *Pterostoma palpina* Clerck, *Xestia*

sexstrigata Haw., *Lithophane leautieri* Boisd., *Apamea anceps* D. & S. and *Dryobotodes eremita* F. ab. *nigra* Cockayne.

HENWOOD, B.—A minute *Epirrhoe alternata* Müll. from Devon.

HOLLAND, N.—*Eupithecia simpliciata* Haw. from I.o.W.

JENKINS, A.—From the Breckland: *Cyclophora porata* L., *Lithostege griseata* D. & S. and *Sesia apiformis* Clerck. From the Lake District: *Eustroma reticulata* D. & S.; from South Wales: *Eriopygodes imbecilla* F. and from North Wales: *Lycia zonaria* D. & S.

KNILL-JONES, S.—A comprehensive exhibit of mainly scarce species taken in the I.o.W. in 1993; also several aberrations. From Freshwater: *Euplagia quadripunctaria* Poda, 19.viii; *Chilodes maritimus* Tausch., 5.vii; *Euproctis chrysorrhoea* L. ab. *punctella* Strand; a uniformly dark brown *Diarsia rubi* View., 4.ix; *Agrotis cinerea* D. & S. 24.v; *Acronicta alni* L. 28.v; *Spaelotis ravidus* D. & S. 13.vii; *Cucullia chamomillae* D. & S. and a pale yellow *Selenia dentaria* F. 4.vii. From Grasmere: *Lycia hirtaria* Clerck, 23.iv; *Serraca punctinalis* Scop. 26.v; *Odontosia carmelita* Esp.(3) 22.iv, a new vice-county record; *Drymonia dodonaea* D. & S. 12.v; *Tethea or* D. & S. 12.v; *Philereme vetulata* D. & S. 1.vii and 2.vii; *Semiothisa alternaria* Hüb. and an extreme ab. of *Trichopteryx carpinata* Borkh. From elsewhere, a bred series of *Lithophane semibrunnea* Haw. from Binstead; *Plagodis pulveraria* L. from Havenstreet, 10.v. and 12.v and *Euchroea nebulata* Scop. Arreton, 23.v.

KOLAJ, A.—Exhibit included, from Coventry, yellow forms of *Cryphia domestica* Hufn.; *Noctua comes* Hüb. ab. *sagittifer* Cockayne, 30.vii.1992; *Agriopus marginaria* F. ab. *fuscata* Mosley; an aberration of *Lomographa temerata* D. & S. and *Odontopera bidentata* Clerck ab. *nigra* Prout. From West Sussex: *Heliothis peltigera* D. & S. bred from larvae found on *Senecio viscosus* L.; *Lycia zonaria* D. & S. from Conway, North Wales and *Drymonia ruficornis* Hufn. with extra white markings from Grendon, War.

LANGMAID, J. R.—*Zygaena lonicerae* Schev. ab. *centripuncta* Tutt, Browndown, Hants, 18.vi.1993; *Opisthograptis luteolata* L. ab. *ruficosta* Lempke, Southsea, Hants, 30.vii.1993 and *Autographa gamma* L. ab. with 'Y' mark obsolete on right forewing, and replaced with small curved dash on left forewing, Southsea, 17.v.1993.

LANGMAID, J. R. & AGASSIZ, D.—From St Martins, the Scilly Isles: *Agrotis puta insula* Rich., 21.ix.1993; *Eumichtis lichenea scillonea* Rich., 20.ix and *Thalpophila matura* Hufn. F. *trescoensis* Rich., 18.ix.1993.

MACNULTY, B.—A selection of moths from the Gower Peninsula of which the most noteworthy was *Lasiocampa trifolii* D. & S. Other species included *Furcula bicuspis* Borkh., *F. bifida* Brahm, *L. quercus* L., *Philudoria potatoria* L., *Polyploca ridens* F. and *Cymatophorina diluta* D. & S.

MCCORMICK, R. & PENNEY, C.—Species taken in Derbyshire, late August 1993 included *Antitype chi* L., both ab. *olivacea* Steph. and ab. *nigrescens* Tutt, *Amphipoea lucens* Freyer, *Standfussiana lucerneae* L. and *Epirrita filigrammaria* H.-S. *Drepana curvatula* Borkh. from Pagham, Sussex; *Pelosia obtusa* H.-S. from Catfield, Norfolk; a pink form of *Orthosia gracilis* D. & S. from Mull and *Xanthorhoe fluctuata* L. f. *thules* Prout from Chelmsford, Essex.

MENZIES, I.—Three species of *Acherontia*—*A. atropos* L. from Braunton, Devon, viii.1944, and for comparison: *A. lachesis* F. from South India and *A. styx* Westw. from Qatar.

MIDDLETON, H. & SCANES, J.—From the Norfolk Broads: *Photedes brevilinea* Fenn, *P. pygmina* Haw. *Pelosia obtusa* H.-S., *P. muscerda* Hufn., *Coenobia rufa* Haw. and *Phragmataecia castaneae* Hüb. From the Norfolk coast: *Photedes elymi* Treits. and *Mythimna litoralis* Curt. and from north Surrey: *Dicycla oo* L., including ab. *renago* Haw. All were taken in 1993.

NATURAL HISTORY MUSEUM—Two display boards describing the scope and origins of the Rothschild-Cockayne-Kettlewell Collection and the National Collection of Lepidoptera. The Cockayne Trust and the Cockayne Research Fellowship were explained. Several drawers of the National Collection were exhibited.

OWEN, D.—Part of a random sample of *Callimorpha dominula* L. from Cothill, Oxon. in 1992, when there was a population explosion. It included no *bimacula* Cockayne (none seen since 1959), one *medionigra* Cockayne (heterozygote) and two approaching this, and the remainder homozygous *dominula*. Recent experimental work has shown that the expression of *medionigra* is affected by temperature, many more *medionigra* being produced in high, constant temperatures, making Ford's predictions invalid. Also shown was a photograph of a *C. dominula* larva feeding on a spore-bearing cone of *Equisetum telmateia*; apparently there being only one previous record of the larva of a moth feeding on *Equisetum* in Britain.

PARSONS, M.—*Mythimna turca* L. from Richmond Park, Surrey, 3.vii.1993. Also a dark *Lymantria monacha* L. from the same locality, 16.vii.1993.

PARTRIDGE, R.—Species taken near Ely which are uncommon in East Cambs.; they included *Cossus cossus* L.; *Synanthedon formicaeformis* Esp., 14.viii.1993 on flowers of *Mentha* × *rotundifolia* (L.) Hudson; *Hydriomena impluviata* D. & S., 10.vii.1993; *Rheumaptera cervicalis* Scop., 11.iv.1991; *Semiothisa wauaria* L., 16.vii.1993; *Hyloicus pinastri* L., 17.vii.1993; *Rhyacia simulans* Hufn., 26.ix.1991; *Lithophane semibrunnea* Haw., 5.x.1991; *L. ornitopus* Hufn., 7.x.90; *Dryobotodes eremita* F., 2.ix.1992; *Chilodes maritimus* Tausch., 29.vi.1992; *Heliothis viriplaca* Hufn., 15.viii.1993, possibly a first county record; *Earias clorana* L., 25.v.1992 and *Nycteola revayana* Scop., 17.iii.1992.

PEACH, D.—*Scopula marginepuncta* Goeze from Ryde, I.o.W., 22.v.1993, with two transverse black lines on a pale yellow background (Plate II, Fig. 7), and from Havenstreet, I.o.W., 16.vii.1993, *Idaea biselata* Hufn. ab. *fimbriolata* Steph.

PHILLIPS, J.—Taken in 1993, *Photedes brevilinea* Fenn ab. *sinelinea* Farn from Barton Broad, Norfolk; *Eilema pygmaeola* Doubl., Winterton Dunes, Norfolk; *Polia bombycina* Hufn., Tilshead, Wilts. and *Adscita statices* L. from Odiham Common, Hants.

PICKLES, A. J. & C. T.—*Acronicta psi* L. ab. *virga* Tutt from Cradley Heath, Staffs., 2.vii.1993.

PORTER, J.—The first British specimen of *Athetis hospes* Freyer (Plate II, Fig. 5), Lizard, Cornwall, 26.viii.1978; *Hylaea fasciaria* L. ab. *grisearia* Fuchs; a pale *Drymonia dodonea* D. & S.; *Arctia villica* L. ab. *ursula* Schultz from Dungeness, 13.vi.1980; *Ochropleura plecta* L. with a scale defect and *Euproctis chrysorrhoea* L. with black V-shaped markings.

ROUSE, T.—Unexpected species found in Reinden Wood, Kent, in 1992/93—*Hydrelia sylvata* D. & S., *Hepialus fusconebulosa* De Geer, *Anaplectoides prasina* D. & S. and *Ptilophora plumigera* D. & S. *Synanthedon vespiformis* L. from Blean Woods, Kent; *S. formicaeformis* Esp. from Romney, Kent and; *S. anthraciniformis* Esp. from the downs and the Warren, Folkestone, Kent.

RUSSWURM, A. D. & MIDDLETON, H.—*Sphinx ligustri* L. ab. *albescens* Tutt (Plate II, Fig. 11), Brockenhurst, 28.vi.1993. The aberration also occurred there in 1976 and 1985.

SHARPE, P.—Aberrations of *Deilephila elpenor* L., *Mimas tiliae* L., *Laothoe populi* L., *Lomaspilis marginata* L. (Plate II, Fig. 1) and *Ennomos erosaria* D. & S. *Trigonophora flammea* Esp., Dorset, 10.x.1993, and from larvae found in imported lettuce *Spodoptera littoralis* Boisd. and *Heliothis armigera* Hübn.

SIMMONS, M.—An aberration of *Xanthorhoe fluctuata* L. with the dark median

fascia reduced to a triangle on the costa with its apex just beyond the discal spot, an enlarged subterminal fascia, darker than usual hindwings and all other markings less well defined.

SIMSON, E. C.—Examples of phaeism, usually due to aberration, sometimes to geographical variation.

SKINNER, B.—A series of *Agrochola haematidea* Dup. bred from collected larvae, Sussex, vi.1993; also photographs of larvae, pupae and live adults. *Hadena perplexa capsophila* Dup. from larvae, Inisheer, Aran Islands, viii.1992; *Standfussiana lucerneae* L. from Folkestone, 7.vii.1993; *Meganola strigula* D. & S., Silchester, Hants, 2.vii.1993 and *Agrotis exclamationis* L. ab. *ostrovichi* Diosz. from Addington, Surrey, 16.vi.1993 (orbicular of forewing absent).

SKINNER, B. & ELLIOTT, B.—*Odontognophos dumetata* Treits. from larvae collected in the Burren, Co. Clare in v.1993; photographs of all stages were exhibited, also of a parasite.

STERLING, M. & P.—*Hippotion celerio* L. found in a greenhouse in Coombe Keynes, Dorset, 14.x.1993 by Mr A. Johnson. *Pelosia obtusa* H.-S. from Norfolk, 28.vii.1993 and *Euxoa cursoria* Hufn., Winterton-on-Sea, Norfolk, 28.vii.1993. The first British specimen of *Pardasena virgulana* Mab. (Plate II, Fig. 3), a tropical African species, taken at light, Thorpe-le-Soken, 27.ix.1992.

TOWNSEND, M.—*Aplocera efformata* Guen. ab. with first, third and fourth cross lines absent, Oxford, 11.viii.1993; *Chloroclysta miata* L. two specimens with pinkish-brown streaks, Kirkhill Forest, Aberdeenshire, x.1986; *Biston betularia* L., Harpenden, Herts., 10.vii.1991, ab. with forewings typical and hindwings intermediate; *Orthosia gracilis* D. & S. from Newtown, Powys, iv.1988, both pinkish and dark forms with especially dark hindwings from lowland beside the River Severn where *Myrica* is absent. An asymmetrical ab. of *Orthosia cruda* D. & S.; the first county record of *Spargania luctuata* D. & S. taken at Harpenden, 31.v.1992 and *Rhyacia simulans* Hufn. bred from female taken at Harpenden, 8.ix.1992, the only imago from 200 first-instar larvae, the larva fed on false oat grass when small, on dandelion in final instar.

WARING, P., on behalf of Butterfly Conservation and the Joint Committee for the Conservation of British Invertebrates.—A display explaining the national survey of *Cossus cossus* L., and requesting post-1979 records. Display included photograph of larva, also samples of worked timber, an extruded pupal case and an up-to-date distribution map from the forthcoming atlas of the rarer macro-moths of Great Britain.

WARNE, B.—A melanic *Drymonia ruficornis* Hufn. from Binstead, I.o.W., 15.iv.1992; *Callistege mi* Clerck, Ashey, I.o.W., 26.v.1993, ab. An ab. with pale forewings and dark yellow hindwings of *Pseudopanthera macularia* L., Havenstreet, I.o.W.

WEST, B. K.—*Ligdia adustata* D. & S. ab. *plumbea* Cockayne (Plate II, Fig. 2) from Brockenhurst, Hants, 29.v.1987, only the second recorded specimen; from Dartford, Kent: *Crocallis elinguaria* L. ab. *obvriaria* Ljungdahl, 22.vii.1977 and ab. *nigrolineata* Lempke, 4.viii.1988; *Ennomos alniaria* L. ab. *concolor* Lempke, 18.ix.1985 and ab. *destrigaria* Cockayne, 21.viii.1990, apparently the second recorded specimen; *Ennomos fuscantaria* Haw. ab. *juncta* Wize, 9.ix.1988 and ab. *perifuscata* Rebel, 4.ix.1988.

WINTER, P.—From North-east Yorkshire (VC62) the first vice-county record of *Eupithecia abietaria* Goeze, North York Moors, 30.vi.1993. From South-east Yorkshire (VC61) *Eupithecia pimpinellata* Hüb., bred from larva on *Pimpinella saxifraga* L. at Muston, 21.ix.1992; a bilateral gynandromorph of *Agrotis exclamationis* L. (Plate II, Fig. 13), Muston, 30.vi.1993; *Lygephila pastinum* Treits., Muston; *Rhyacia simulans* Hufn. and *Apamea furva* D. & S., Flamborough.

10.viii.1993; *Photodes fluxa* Hübn. and *Coenobia rufa* Haw. from Kirkham Abbey, 16.vii.1993.

BRITISH MICROLEPIDOPTERA

ALEXANDER, K. N. A. & FOSTER, A. P.—*Epischnia bankesiella* Richardson, first north Wales record, 12.vii.1993, Lleyn Peninsula, Caer., adult swept in vicinity of *Inula crithmoides* L.

BAKER, P.—*Sclerocona acutella* Evers., Thorpe, Surrey, 13.vi.1989; this is only the second recorded British specimen. A short note will appear in the journal in due course.

BEAUMONT, H. E.—*Luffia ferchaultella* (Steph.), cases common among lichen growing on a grave memorial at Collingham churchyard, Wetherby, Yorks. (VC64), 25.vi.1993 (D. H. Smith), many female moths reared, first Yorkshire record. *Phyllonorycter cerasicolella* (H.-S.), larval mines fairly common in leaves of cherry at Edlington Wood, Doncaster, Yorks. (VC63) 11.x.1992, moths reared mid-March 1993. It is exactly one hundred years ago that this moth was first found in Britain at nearby Wheatley Wood (now destroyed), still the most northerly British locality. There have only been two further Yorkshire records in the intervening years. *Chrysoesthia sexguttella* (Thunb.), two moths were reared in April 1993 from larvae in blotch mines of sea purslane (*Halimione portulacoides* L.) at Spurn, Yorks. (VC61), 26.ix.1992, an unrecorded foodplant. *Stathmopoda pedella* (L.), three previous single records suggested that this moth may be resident in Yorkshire. At Bolton-on-Dearne, Yorks. (VC63), moths were disturbed commonly from alders on 30.iv.1993 and a single moth occurred among alder near West Melton, Yorks. (VC63) on 2.vii.1993. *Ptycholomoides aeriferanus* (H.-S.), Ecclesall Wood, Sheffield, Yorks. (VC63), 3.vii.1993. First VC63 and second Yorkshire record, (previous record from VC61 in 1992). *Lozotaeniodes formosanus* (Gey.) at m.v. light, West Melton, Rotherham, Yorks. (VC63), 8.vii.1993. First VC63 record (previous Yorkshire records were of single moths at three localities in VC61 in 1992). *Epiblema grandaevana* (Lien. & Zell.) Taken in the R.I.S. trap at Spurn, Yorks. (VC61), 9.vi.1993 (B. R. Spence), first VC61 record and the first in Yorkshire since 1909. The date of capture appeared to be very early as previous dated Yorkshire records were all of moths taken in July; however it accords with the dates of moths recorded in Northamptonshire in 1992 (Gardiner & Hilliard, *Entomologist's Rec. J. Var.* **105**: 239–40). *Crambus uliginosellus* Zell., a few moths were in a boggy area of Skipwith Common, Yorks. (VC61), 17.vii.1993. A previous record from this locality in 1895 and a single moth at Hatfield Moor (VC63) in 1967 are the only other Yorkshire records. *Evergestis pallidata* (Hufn.), Skipwith Common, Yorks. (VC61), 17.vii.1993. This moth is showing signs of becoming established in Yorkshire with other recent records from Spurn (VC61) and three localities in VC63 in the last two years.

BLAND, K. P.—*Elachista alpinella* Staint. from southern Scotland to show range of variation in intensity of markings and in the size. *E. eskoi* Kyrki & Karvonen, superficially like a large *E. kilmunella* Staint., but has a characteristic smooth grey coloration. It is now known to be quite widespread in Scotland, being recorded from VCs 79, 80, 81, 83, 88, 95 & 96. The examples were from Camghouran, Rannoch, 19.vi.1977, NN 5656, VC88; Whitelaw Moss, Selks., 3.vii.1981, NT 5028, VC79; Auchencorth, Midloth., 11.vi.1992, NT 2057, VC83 (original British locality). *Cydia tenebrosana* Dup., taken at light 2/3.vii.1993 at Haughend, Angus (NO 5774, VC90); a very local species in Scotland. *Cydia molesta* Busck, reared from larva in a French apple purchased in Edinburgh, Midloth. (VC83), imago emerged 7.vi.1993.

BRADFORD, E. S.—(1) From Sandwich Bay Bird Observatory, all at light traps: *Yponomeuta sedella* Treits., viii.1993; *Oinophila v-flava* Haw., 17.v.1993; *Thisanotia chrysonuchella* Scop., 26.v.1993; *Hypochalcia ahenella* D. & S., 17.vi.1993; *Chilo phragmitella* Hübn., 8.ix.1993; *Anerastia lotella* Hübn., 7.vii.1993; *Pediasia contaminella* Hübn., 31.vii.1993; *Mellisoblaptes zelleri* Joann., 26.vi.1993; *Olethreutes lacunana* D. & S., 25.vi.1993; *Nyctegretis lineana* Scop., 26.vi.1993.

(2) From other localities: *Phycitodes maritima* Tengst., 5.vii.1993, Pean Hill, Whitstable, Kent; *Pexicopia malvella* Hübn., 27.vii.1993, Pean Hill; *Monochroa moyses* Uffen, 27.vi.1993, Pean Hill, *Stigmella samiatella* Zell., 24.v.1992, Pean Hill; *Monochroa moyses* Uffen, 3.vii.1971, Mucking, Essex; *M. lucidella* Steph., 4.vii.1993, Seasalter, Whitstable, Kent; *Adela croesella* Scop., 6.vi.1993, Chilham Down, Kent.

BROTHERIDGE, D.—Specimens nationally rare or new to Wiltshire. *Denisia albimaculea* Haw., 28.vi.1993, Marlborough Downs, VC7, new to county. *Aplota palpella* Haw., 28.vii.1993, Lover, VC8, new to VC. *Acanthophila alacella* Zell., 4.viii.1991, Lover, VC8, new to county. *Epiphyas postvittana* Walk., 21.viii.1993, Wroughton, VC7. *Eucosma conterminana* H.-S., 20.vii.1993, Wroughton, VC7, new to county. *Pediasia aridella* Thunb., 25.vi.1992, Pound Bottom, VC8, new to county. *Pyralis lienigialis* Zell., Wootton Bassett, VC7, 14.viii.1991; near Minety, VC7, 9.viii.1992. *Ancylosis oblitella* Zell., Wroughton, VC7, 10.viii.1992. *Phycitodes saxicola* Vaugh., Wroughton, VC7, 25.vii.1993.

CLANCY, S. P.—Included in the exhibit were six species of Pyralidae: *Eudonia alpina* Curtis, taken at Coylum Bridge, Inv., late May 1993. These are of interest because of the early date involved, the Caledonian Forest habitat from which they were taken and the low altitude at which they occurred (c. 250 m). *Sitochroa palealis* D. & S., a female, perhaps of Continental origin, taken at Dungeness, Kent, 7.vii.1993. *Sciota adelphella* F. R., a short series bred from a female taken New Romney, Kent, 18.vii.1992; this appears to be a species now established in the Dungeness Lydd New Romney area. *Agriphila geniculea* Haw., a specimen taken at Lydd, 10.ix.1993, showing dark shading between the median and subterminal fasciae; *Scoparia pyraletta* D. & S., a specimen approaching f. *purbeckensis* Bankes from Dungeness on 21.vi.1993; *Homoeosoma sinuella* F., a specimen with the cross-lines unusually juxtaposed, and the area between them shaded with dark scaling, Lydd, 31.vii.1993.

CORLEY, M. F. W.—Interesting Lepidoptera from Oxfordshire and Wiltshire. *Bohemannia auriciliella* Joannis (*Ectoedemia bradfordi* Emmet), Lover (VC8), 24.vi.1993; the third British specimen; otherwise known only from single examples in Brittany and the Netherlands. *Elachista unifasciella* Haw., Knap Hill (VC7), 14.viii.1993. *Caryocolum viscarium* Staint., Bladon Heath, Woodstock (VC23), 22.vii.1993, new to Oxfordshire. *Acanthophila alacella* Zell., Lover (VC8), 28.vii.1993. *Exapate congelatella* Clerck, Pucketty Farm, Faringdon (VC22), 4.i.1993; thought to have been introduced to the site with trees from a Shropshire nursery. *Hypsopygia costalis* F. ab., Pucketty Farm, Faringdon (VC22), 18.viii.1993.

HARPER, M.—*Mompha bradleyi* Reidl, a species new to Britain. Specimens of this moth were bred from small green galls on *Epilobium hirsutum* L. during late summer of 1991 from several sites in Herefordshire. At the time it was considered to be a new pabulum for the closely related *M. divisella* H.-S., also a gall-feeder on other *Epilobium* species, e.g. *E. montanum* L., *E. palustre* L. and *E. lanceolatum* Sebast. & Mauri. *Mompha bradleyi*, known from central and western Europe had not been recognized as a British species until 1991, although it is likely that specimens exist unrecognized in collections. Galls are seen usually on lateral side shoots just below the flowers, in August and early September. Moths appear in September from pupae within the gall and then hibernate until the following spring and early summer.

Hibernated moths have been seen on the wing in the middle of June, and so far these have all proved to be females. *M. divisella* is probably univoltine; the imagines appearing earlier in July and August and then hibernating through to the following spring. It is difficult to separate the adults of either species on macroscopic criteria reliably, and even the female genitalia of both are very similar and variable. The male genitalia however do show reliable and consistent features separating the two species. Mr J. C. Koster of the Netherlands, suggested that these bred moths might be *M. bradleyi* Reidl and confirmed their identity.

HECKFORD, R. J.—*Stigmella auromarginella* Rich., Portland, Dorset (VC9), bred from *Rubus fruticosus* agg., 29.vi.1993 (with Dr J. R. Langmaid). *Coleophora siccifolia* Staint., Great Plantation, Devon (VC3), bred from *Sorbus aucuparia* L., 16–22.v.1993, new to Devon. *C. orbitella* Zell., Haldon Hill, Devon (VC3), 23.vii.1993. *Anarsia lineatella* Zell., local shop, Lizard, Cornwall (VC1), bred from nectarine, 14.ix.1993. *Batrachedra parvulipunctella* Chret., Cadgwith, Cornwall (VC1), 18.viii.1991, new to Britain; otherwise known only from Tunisia and Sicily (*B. pinicolella* Zell. shown for comparison). *Acleris umbrana* Hübn., Heybrook Bay, Devon (VC3), bred from *Prunus spinosa* L., 25.x.1992 and 4.vii.1993, new to Devon, and first record of two broods. *Agriphila geniculea* Haw., Kennack Sands, Cornwall (VC1), 26.viii.1993, a form with forewings chocolate brown except the area between the cross lines which was grey (Plate II, Fig. 14). *Homoeosoma nimbella* Dup., St Mary's, Isles of Scilly, Cornwall (VC1), 4.vi.1993.

HENWOOD, B.—*Cydia prunivorana* Rag., Colyton, Devon, at m.v. light, 3.vii.1993. Previously known in Britain only from five specimens from Kent, and a few from Plympton and Colyton, Devon.

HOARE, R. J. B.—(1) From Branscombe, S. Devon. *Stigmella auromarginella* Rich., mines on *Rubus fruticosus* agg. collected 11.x.1992, moths produced early November 1992, new to Devon. *Ectoedemia erythrogenella* Joann., mines on *Rubus fruticosus* collected 11.x.1992, moths produced July 1993, new to Devon. *Trifurcula subnitidella* Dup., two flying near *Lotus corniculatus* L. at about 8 p.m., 7.viii.1993. *Leucoptera lathyrifoliella* Staint., three bred from *Lathyrus sylvestris* L. (mines collected 7.viii.1993), compared with two dwarf specimens bred from *Lathyrus pratensis* L. (mines collected 7.viii.1993). The mines on *L. pratensis* were adjacent to heavily-attacked *L. sylvestris*.

(2) Moths from Portland, Dorset. *Cochylis roseana* Haw., two flying 1.viii.1993. *C. hybridella* Hübn., one flying 29.viii.1993. *Eucosma pupillana* Clerck, one resting on *Artemisia absinthium* L., 1.viii.1993. *Acroclita subsequana* H.-S., two flying 29.viii.1993. *Collicularia microgrammana* Guen., two flying 3.vi.1993. *Capperia britanniodactyla* Greg., three bred from larvae on *Teucrium scorodonia* L. collected 3.vi.1993. *Leioptilus carphodactyla* Hübn, four of many bred from pupae in flower-heads of *Inula conyzoides* (Griess.) Meikle, collected 15.viii.1993.

(3) Moths from other localities in Devon. Instow (VC4): *Stigmella anomalella* Goeze, two small black-headed specimens bred from larvae on *Rosa pimpinellifolia* L. collected 15.vi.1993. From unimproved grassland near Exeter University campus: *Isophrictis striatella* D. & S., *Nemophora minimella* D. & S. and *Dichrorampha consortana* Steph., all taken in the evening, 26.vii.1993. Northernhay Gardens, Exeter: *Glyptipteryx linneella* Clerck, a male and female from lime trunks, 28.vii.1993. Bicton Common, Woodbury (VC3): *Buckleria paludum* Zell., three flying at about 8–8.30 p.m., 3.viii.1993 over boggy heathland.

KNILL-JONES, S. A.—The following all taken at m.v. light at Freshwater, Isle of Wight, unless stated otherwise. *Zelleria hepariella* Staint., 14.vii.1987, new vice-county record. *Crocidozema plebejana* Zell., 18.xi.1990, new vice-county record. *Pammene*

aurantiana Staud., 27.vii.1992. *P. regiana* Zell., 11.vii.1992. *Udea fulvalis* Hübn., 8 & 11.viii.1993. *Hedya salicella* L., Cranmore, 1 & 2.vii.1993. *Apotomis turbidana* Hübn., Cranmore, 30.vi.1993. *Acleris cristana* D. & S., 30.i & 31.iii.1993. *A. literana* L., Cranmore, two, 21.iv.1993. *Phycita roborella* D. & S., Cranmore, 1.vii.1993. *Hypochalcia ahenella* D. & S., Compton Down, two, 24.vi.1993; Cranmore, 29.vi.1993. *Acrobasis repandana* F., Cranmore, 31.vi.1993. *A consociella* Hübn., Cranmore, 30.vi & 2.vii.1993. *Capperia britanniodactyla* Greg., Cranmore, 2.vii.1993. Dwarf examples of the following (sizes are wing-spans): *Aphomia sociella* L., 14.vii.1993, 21 mm, *Myelois cibrella* Hübn., 9.vii.1993, 22 mm. *Agriphila straminella* D. & S., 28.vii.1993, 13 mm. *Hypsopygia costalis* F., 2.viii.1993, 12 mm.

LANGMAID, J. R.—*Stigmella auromarginella* Rich., two bred from *Rubus fruticosus* agg. from Overcombe, and one from Portland, Dorset; mines found 12.vi.93 with R. J. Heckford. *Oinophila v-flava* Haw., St Martin's, Isles of Scilly, one taken indoors, 18.ix.1993, with D. J. L. Agassiz. *Caloptilia leucapennella* Steph., a series bred from *Quercus ilex* L. from Tresco, Isles of Scilly, larvae found 20.ix.1993, with D. J. L. Agassiz. *Calybites phasianipennella* Hübn., a series bred from *Rumex acetosa* L., St Mary's, Isles of Scilly, mines found 18.ix.1993, with D. J. L. Agassiz. *Phyllonorycter viminiella* Sirc., a series bred from *Populus tremula* L. (a previously unrecorded foodplant), Havant Thicket, Hants., 11.ix.1992, when mines abundant. *Glyphterix schoenicolella* Boyd, a series bred from *Juncus bufonius* L., a previously unrecorded foodplant, Hartland Moor, Dorset; foodplant gathered 26.vii.1993; with R. J. Heckford and P. H. Sterling. *Digitivalva perlepidella* Staint., a specimen taken near Steep, Hants., 21.v.1993, new to Hampshire. *Epermenia chaerophyllella* Goeze, two specimens of a very dark form, bred from *Daucus carota* L., Grays, Essex, larvae found 18.vii.1993, with D. J. L. Agassiz. *Coleophora deviella* Zell., one taken Gibraltar Point, Lincs., 22.vi.1993, with P. H. Sterling, new to Lincolnshire. *C. murinipennella* Dup., a series bred from *Luzula multiflora* (Ehrh.) Lej., Laggan, Inv., cases found 27.vi.1992, cases also exhibited. *Agonopterix atomella* D. & S., one bred from *Genista tinctoria* L., North Walney, Cumbria, larva found 26.vi.1993. *Eulamprotes wilkella* L., one taken with the aid of a bee-smoker, Saltfleetby-Theddlethorpe, Lincs., 23.vi.1993, with P. H. Sterling. *Pseudotelphusa scalella* Scop., one taken at m.v. light, Southsea, Hants., 6.vi.1993. *Bryotropha galbanella* Zell., one taken at Glen Quoich, Aber., 1.vii.1993, with R. M. Palmer & M. R. Young. *Gelechia hippophaella* Schrank, one of a series bred from *Hippophaë rhamnoides* L., Gibraltar Point, Lincs, larva found 22.vi.1993, with P. H. Sterling. *Mompha langiella* Hübn., series bred from *Circaeа lutetiana* L., Ashurst, Hants., 12.vii.1993, plus a pressed sprig from a large stand of the foodplant all of which was blanched by the larval mines, giving the appearance of the whole area having been sprayed with herbicide. *Olethreutes metallicana* Hübn., series taken at Glen Quoich, Aber., where the moth was abundant on 1.vii.1993, with R. M. Palmer & M. R. Young. *O. lacunana* D. & S., a specimen of the reddish form which is endemic to the Isles of Scilly, St Mary's, 18.ix.1993, with D. J. L. Agassiz. *Epinotia signatana* Dougl., a specimen taken at Botley Wood, Hants., 17.vi.1993. *Epiblema cnicicolana* Zell., a specimen taken at Portland, Dorset, 12.vi.1993, with R. J. Heckford. *Cydia cognatana* Barr., a specimen taken at Glen Quoich, Aber., 1.vii.1993, with R. M. Palmer & M. R. Young, first confirmed Aberdeenshire record. *Dichrorampha montanana* Dup., two of a series disturbed from a clump of *Tanacetum vulgare* L., Saltfleetby-Theddlethorpe, Lincs., 23–24.vi.1993, with P. H. Sterling. *Plodia interpunctella* Hübn., a specimen taken at m.v. light, Southsea, Hants., 2.ix.1993.

MANNING, D. V.—Moths new to Northamptonshire exhibited by D. V. Manning, collected by C. Gardiner: *Parachronistis albiceps* Zell., Collyweston Great Wood,

10.vii.1992; *Platytes alpinella* Hübn., Easton Hornstocks NNR, 7.vii.1992. *Spatialistis bifasciana* Hübn., Collyweston Great Wood NNR, 31.v.1992. *Metzneria aprilella* H.-S., Barnack Hills & Holes NNR, 24.vi.1992. *Coleophora* sp. (?), with unusual ornamented abdomen, Easton Hornstocks NNR, 24.v.1992.

MCCORMICK, R. & PENNEY, C.—*Schoenobius gigantella* D. & S. from Stoke Saltings, Kent, 30.vii.1993, (Plate II, Fig. 6).

O'KEEFFE, D.—*Gelechia senticetella* Staud., the second British specimen, taken at Petts Wood, Kent, 23.vii.1992, see *Entomologist's Rec. J. Var.* **105**: 176. *Caloptilia falconipennella* Hübn., Bexley, Kent, six specimens bred ix. 1993—a second Kentish locality for this species. *Nemapogon ruricolella* Staint., Faggs Wood, Ham Street, Kent, a series bred from a small quantity of dead oak sticks collected from the woodland floor, 15.v.1994. *Pammene obscurana* Steph., Dartford Heath, Kent, 6.v.1993, three specimens beaten from birch, with specimens of *P. agnotana* Reb. for comparison.

PARSONS, M. S.—(1) From East Kent: *Coleophora otitae* Zell., Hythe Ranges, 6.vii.1993; *C. saturatella* Staint., Dungeness, 6.vii.1993; *Pempeliella ornatella* D. & S., Folkestone Warren, 7.vii.1993; *Melissoblaptes zelleri* Joannis, Greatstone Dunes, 7.vii.1993; *Sciota adelphella* F. R., Dungeness, 24.v.1993; *Capperia britanniodactyla* Greg., Shakespeare Cliff, 27.v.1993. (2) From Richmond Park, Surrey: *Coleophora hemerobiella* Scop., bred 8.vii.1993; *Stathmopoda pedella* L., 25.vi.1993; *Athrips rancidella* H.-S. 23.vii.1993. (3) From Mount Caburn NNR, E. Sussex, *Pempelia obductella* Zell., 8.viii.1993.

PICKLES, A. J. & C. T.—*Donacula forficella* Thunb., a varied series from the New Forest bogs and showing the dark form described by Fassnidge from this locality. *Pediasia contaminella* Hübn. ab. *sticheli* Constant, a series from the Norfolk Coast where this dark form was found to be frequent this year. *Anerastia lotella* Hübn., a series from the Norfolk Coast including specimens with distinct black dusting on the nervures, similar to those described by Barrett as being taken by G. F. Matthew on the East Coast.

PORTER, J.—Moths exhibited by J. Porter, collected by S. H. Church. An example of the darker New Forest form of *Elophila nymphaeaata* L. Also, the rare migrant *Maruca testulalis* Geyer, Swanage, Dorset, 31.viii.1991.

SIMMONS, M. J.—(1) Some pyralid moths from Crowborough, East Sussex. *Agriphila selasella* Hübn., 1.viii.1993; *Evergestis pallidata* Hufn., 31.vii.1992, 1.viii.1993; *Udea prunalis* D. & S., melanic form, 25.vi.1993; *Orthopygia glaucinalis* L., 21.vii.1993; *Pyralis farinalis* L., 12.vii.1992; *Galleria mellonella* L., 14.ix.1991, 31.vii.1992; *Pempelia palumbella* D. & S., 3.vii.1993; *Phycita roborella* D. & S., 6.vii.1993; *Dioryctria abietella* D. & S., 5.vii.1991, 8.vii.1993; *D. mutatella* Fuchs, fuscous form, 25.vi.1992; *Acrobasis consociella* Hübn., 31.vii.1993. (2) Some pyralid moths from Norman Bay, East Sussex. *Chilo phragmitella* Hübn., 23.vii.1992; *Cynaeda dentalis* D. & S., 19.vii.1992, 20.vii.1993; *Sitochroa palealis* D. & S., 25.vii.1992; *Ostrinia nubilalis* Hübn., 23.vii.1992; *Ebulea crocealis* Hübn., 25.vii.1993; *Dolicharthria punctalis* D. & S., 19.vi.1993; *Synaphe punctalis* F., 17.vii.1993, 29.vii.1993; *Homoeosoma sinuella* F., 19.vi.1993, 17.vii.1993; *Phycitodes maritima* Tengst., 22.vii.1993.

SKINNER, B.—(1) A specimen of *Sciota adelphella* F. R., bred from a larva taken on white willow (*Salix alba* L.) at Greatstone, Kent, 23.viii.1992; and two others bred from a female taken at New Romney, Kent, in July 1992 by K. Redshaw. Photographs of the egg, larva, pupa, cocoon and live adult were included in the display. (2) A selection of local or aberrant Pyralidae taken during 1993: An extreme melanic *Scoparia ambigualis* Treits., Ham Street, Kent, 19.vi (Plate II, Fig. 16). One male

and two female melanic *Donacaula forficella* Thunb., New Forest, Hants, 3.viii. Short series of *Pempeliella ornatella* D. & S., Folkestone Warren, Kent, 7.vii. A short variable series of *Scoparia pyralella* D. & S. which included the whitish forms *alba* Tutt and *ingratella* Zell. all netted at dusk at Dungeness, Kent, 9.vi. An extreme melanic male *Synaphe punctalis* F., Dungeness, Kent, 9.vi. A female *Acrobasis tumidana* D. & S., Pagham, Sussex, 14.viii. A male and female example of the dark fuscous form of *Phycita roborella* D. & S., St Martha's Hill, Surrey, 21.vii. Two melanic specimens of *Elophila nymphaeata* L., New Forest, Hants, 3.vii. Three male and one female *Anerastia lotella* Hübn. showing variable degrees of grey dusting and dark subcostal streak on the forewing, Yarmouth district, Norfolk, 1.viii.

STERLING, D. H., M. J. & P. H.—*Opostega auritella* Hübn., taken at m.v. light, Barton Broad, Norfolk, 29.vii.1993. *Glyphipteryx schoenicolella* Boyd, Arne, Dorset, bred in numbers from seeds of *Juncus bufonius* L., not related closely to its only known foodplant, *Schoenus nigricans* L. *Acrolepiopsis assetella* Zell., Barton Broad, Norfolk, 29.vii.1993. *Coleophora serpylletorum* Her., bred from *Thymus*, Gt Orme Head, North Wales, coll. 17.iv.1993. *Bryotropha umbrosella* Zell., Merritown Heath, Hurn, Dorset, coll. 27.vii.1993. *Cochylis pallidana* Zell., Winterton-on-Sea, Norfolk, coll. 27.vii.1993. *Cnephiasia genitalana* P. & M., Winchester VC11, 28.vii.1990; originally misidentified as *C. pasiuana*. *Acleris logiana* Clerck, two bred from *Betula* spinnings from Botley Wood, Hants., VC11, 20.ix.1992. *Pediasia fascelinella* Hübn., Winterton, Norfolk, 28.vii.1993. *Mecyna flavalis* D. & S., three at garden m.v. light, Winchester, 1993, the first post-war record for VC11; this follows first recent VC12 specimen exhibited 1988, since when there have been one or two each year. *Homoesoma nimbellia* Dup., Winterton, Norfolk, 27.vii.1993, gen. det. *Cnaemidophorus rhododactyla* D. & S., bred from larvae on *Rosa canina* L., collected May June 1993 in Epping Forest. *Coleophora deviella* Zell., Gibraltar Point NNR, Lincs., 22.vi.1993. *Eulamprotes wilkella* L., Saltfleetby-Theddlethorpe NNR, 23.vi.1993. *Monochroa tetragonella* Staint., Saltfleetby-Theddlethorpe NNR, bred from root of *Glaux maritima* L. coll. 26.vi.1993. *Bryotropha* sp.; considered to be forms of *B. mundella* Dougl., Saltfleetby-Theddlethorpe NNR, Lincs., 23.vi.1993; also included were two from Winterton, Norfolk, 27.vii.1993. *Gelechia hippophaella* Schrank, Gibraltar Pt NNR, Lincs., from larvae on *Hippophaë rhamnooides* L., coll. 22.vi.1993. *Olethreutes lacunana* D. & S., an extreme melanic form, Fir Hill Quarry NR. *Dichrorampha montanana* Dup. Saltfleetby-Theddlethorpe NNR, examples on 23.vi.1993.

TUCK, K. R. & YOUNG, M. R.—A record of *Cydia injectiva* Heinrich, from North Aberdeenshire (VC93), exhibited, together with an example of *C. piperana* Kearfott, which has a very similar biology. See *Br. J. Ent. Nat. Hist.* 7: 1-2; 1994.

YOUNG, M. R.—Scarce Scottish Lepidoptera: *Parornix alpicola* Woeke (*P. leucostola* Pel.-Clin.) Invernaver NNR, Sutherland, 1.vi.1993. *Elachista argentella* Clerck, Longhaven, Aber., 4 & 5.viii.1993. *Amphisbatis incongruella* Staint., Dinnet Muir NNR, Aber., 16.iv.1993. *Xystophora pulveratella* H.-S., Tulloch, Strathspey, 5.vi.1993. *Bryotropha galbanella* Zell., Glen Quoich, Aber., 1.viii.1993. *Olethreutes metallicana* Hübn., Glen Quoich, Aber., 1.vii.1993.

FOREIGN LEPIDOPTERA

BARRINGTON, R.—Gipsy moth, *Lymantria dispar* L., a bilateral gynandromorph (Plate 1, Fig. 15), bred in 1993 at the United States Department of Agriculture Mass Rearing Station at Cape Cod, Massachusetts. The gipsy moth was introduced into the USA from France in 1888/9 and has become a major forest pest in eastern USA, causing millions of dollars worth of damage each year. The Cape Cod Station has

the capacity to rear half a million moths every six weeks, raised on artificial diet. They are bred to produce a virus which is used as a biological pesticide to control wild populations.

CORLEY, M. F. W.—Recent additions to the Lepidoptera of Portugal: *Zygaena rhadamanthus guichardi* Tremewan, first found in 1985 by K. M. Guichard and described by Tremewan in 1991 (Naumann & Tremewan, *Entomologist's Gaz.* 42: 85–88); it flies in March on a small area of dunes on the west coast of the Algarve. *Cucullia calendulae* Treits. (= *C. wredowi* Costa) were first collected by B. Goater in 1989. The remaining 14 species were all first recorded by the exhibitor, with the exception of *Cupido lorquinii* H.-S., which has been reported in the past, but according to Gomez Bustillo and Arroyo Varela, 1981, *Catalogo sistemático de los Lepidópteros ibéricos*, all Portuguese records are referable to *C. osiris* Meig. ssp. *pseudolorquinii* Vty. Although *Idaea fractilineata* Zell. is recorded for Spain by both Culot and Staudinger & Rebel, it does not appear in Gomez Bustillo & Arroyo Varela, even as a synonym.

I. fractilineata, *Euxoa psimmythiosa* Boursin, *Agrotis sabulosa* Ramb., *Mythimna joannisi* Boursin & Rungs and *Clytie sancta* Stdgr were all taken on sand dunes. *Afriblerina terraria* Bang-Haas has been taken on dunes, but also on rocky coasts; it is probably associated with *Juniperus phoenicea* L. *Bryonicta pineti* Stdgr occurs in coastal pine woods. *Eupithecia limbata* Stdgr, *Acasis viretata* Hübn. and *Nola cicatricalis* Treits. are found in the cork oak woods. *Euxoa temera* Stdgr, *Cucullia calendulae* Treits., *Idaea predotaria* Hartig and *Eupithecia dodoneata* Guen. were all taken in inhabited areas with orchards, gardens and cultivated ground mixed with patches of semi-natural vegetation.

EDMUNDS, H. A.—A small but very interesting collection of Heterocera from the lights of a hotel in Drushia, Cyprus, during a ten-day period in October 1993. Provisional determinations made by B. Goater, pending more critical examination in the future. Syntomidae: *Dysauxes famula* Freyer; Pyralidae: *Agriphila tolli* Bles. 2 males, gen. det. There are several eastern Mediterranean species of the *A. geniculea* group which must be dissected before a proper identification can be made. *Ancylolomia palpella* D. & S.; *A. tentaculella* Hübn.; *Duponchelia fovealis* Zell.; *Endotricha flammealis* D. & S.; *Lamoria anella* D. & S.; Lasiocampidae: *Lasiocampa* sp. close to *L. trifolii* D. & S. but differing in several respects, particularly in underside pattern: nothing in de Freina & Witt, *Die Bombyces und Sphinges der Westpaläarktis* quite resembles it; Geometridae: three species of *Idaea*, all of which require critical examination; *Scopula imitaria* Hübn., f. *syriacaria* Culot; two puzzling species of *Ennominae* of uncertain genera; *Dyscia c.f. raunaria* Freyer; *Aspitates ochrearia* Rossi; Thaumetopaeidae: *Thaumetopaea solitaria* Freyer; Arctiidae: *Eilema c.f. morosina* H.-S.; *E. c.f. muscula* Stdgr; Noctuidae: *Euxoa temera* Hübn.; *Agrotis trux* Hübn.; *A. crassa* Hübn.; *Xestia xanthographa* D. & S.; *Mythimna punctosa* Treits.; *M. scirpi* Dup.; two, possibly three, species of *Episema*, a single specimen resembling *E. korsakovi* Christ., a male and four females comparable to *E. lederi* Christ. and another male of perhaps a third species; *Leucochlaena* sp. resembling an un-named species illustrated in Hacker, *Die Noctuidae Griechenlands*; *Polymixis canescens* Dup.; *P. serpentina* Treits.; *Atethmia ambusta* D. & S.; *Xanthia cypreago* Hamps.; *Polyphaenis subsericata* H.-S.; *Luperina dumerilii* Dup.; *Spodoptera cilium* Guen.; *Chrysodeixis chalcites* Esper; *Trichoplusia circumscripta* Freyer; *Acontia lucida* Hufn.

ELSTON, H. V.—Two drawers of butterflies taken during a ten-day visit to the Alpes Maritimes in France during the period 12–23.vi.1993. Fourteen species of fritillary were shown, including *Fabriciana niobe* L., *Issoria lathonia* L., *Brenthis hecate* D. & S., *Mellicta athalia* Rott., which was abundant, *M. deione* Gey. and *M. parthenoides* Kef. The commonest butterfly was probably *Aporia crataegi* L., especially at higher altitudes.

GOATER, B.—(a) A series of the reputedly extremely rare noctuid *Victrix agenjoi* Fernandez from Prov. Valladolid, Spain. Over 200 males (Plate I, Fig. 10) were seen at light and resting on grass stems at night in three localities in which the stony ground was covered with a dense growth of lichens; they were very variable. By searching with a lantern, two brachypterous females (Plate I, Fig. 11) were discovered on grass stems, attended by one or more males. It is believed that the female was previously unknown.

(b) A selection of moths taken during June and July 1993 in the southern half of Sweden and in Denmark, including the following: Zygaenidae.: *Zygaena osterodensis* Reiss, including an orange specimen, *Z. viciae* D. & S., *Z. exulans* Hochen. and *Z. filipendulae* L. from Sweden and *Z. minos* D. & S. from Denmark; Sesiidae: *Pennisetia hylaeiformis* Lasp. bred from raspberry from several localities in both countries; Tortricidae, including *Cochylimorpha hilarana* H.-S., *Olethreutes bipunctana* F., *O. metallicana* Hübn., *O. olivana* Treits., *Apotomis infida* Hein.; Pyralidae, including *Crambus alienellus* Germ. & Kaul., which was abundant on all the bogs, *Agriphila biarmica* Tengst. and *Pediasia truncatella* Zett., both very local in boggy areas, *Catoptria maculalis* Zett. and *Udea hamalis* Thunb. from spruce forest, *U. decrepitalis* D. & S. from ferny stream-banks and *Eudonia aequalis* Kykki & Svensson, which was described in 1985 and of which very few specimens are as yet known; Lasiocampidae: *Cosmotriche lunigera* Esp. from spruce forest; Sphingidae: *Hyles gallii* Rott. taken at light in the middle of a dense spruce thicket; Geometridae including *Chloroclysta infuscata* Tengst. and *C. latefasciata* Stdgr, *Thera serraria* Lien. & Zell., *Rheumaptera subhastata* Nolck. and *R. hastata* L., *Perizoma taeniatum* Steph., *Eupithecia analoga* Djakanov and *E. abietaria* Goeze for comparison, *Archanna melanaria* L. which was abundant in July in boggy woodland where *Ledum palustre* L. grew, and *Parietaria vittaria* Thunb.; Noctuidae, including very dark *Agrotis vestigialis* Hufn., *Epipsilia grisescens* F. ssp. *septentrionalis* Fibiger, *Spaelotis clandestina* Harris, *Cucullia argentea* Hufn., several of which were found at rest on shoots of *Artemisia campestris* L. in Denmark, *Eublemma minutata* F., also from Denmark, and *Sympistis funebris* Hübn. and *S. heliophila* Payk., which fly by day like *Anarta* spp. in the Swedish mountains when the sun shines.

(c) Rare Noctuidae from Spain taken in 1993: *Euxoa psimmythiosa* Boursin (Huelva, May), *Agrotis chretieni* Dumont (Segovia, May), *Agrotis turatii* Standf. ssp. *eumetabola* de Lajonquiere (Teruel, May), *Xestia trifida* F. R. (Valladolid, September), *Cucullia reisseri* Boursin, ex larvis on *Verbascum* (Segovia, em. June), *Criophasia albolineata* Blachier (Almeria, May), *Eremochlaena orana* Lucas (Alicante & Almeria, October), *Agrochola pistacinaoides* d'Aubuisson (Burgos, September), *Atethmia algirica* Culot (Burgos, September), *Cirrhia aurago* D. & S., a series showing extreme variation (Sierra de la Demanda, Burgos, September), *Apamea sicula* Turati (Zaragoza), with *A. monoglypha* Hufn. for comparison, and all five Spanish species of *Pseudohadena*—*P. commoda* Stdgr. (Huesca), *P. mariana* de Lajonquiere (Almeria), *P. roseonitens* Oberth. (Almeria), *P. halimi* Mill. (Huesca) and *P. chenopodiphaga* Ramb. (Huesca).

HALL, N.—(a) Pyralidae from Spain: *Actenia vulpecalis* Rag., two specimens from Puerto de la Mora, Granada, 12–13.vii.1991, apparently new to Europe; *Scirpophaga praelata* Scop., two specimens from the Ebro Delta, Tarragona, 7–8.ix.1992. The exhibitor was grateful to Mr Michael Shaffer for the identifications.

(b) Moths from France and Spain, as follows: *Phyllonorycter comparella* Dup., bred from mines on white, grey and black poplar, July 1988 and July 1993, at Collias, Gard, France, emerging in August of the same year. *Esperia oliviella* F., St Laurent-du-Pape, Ardèche, France, July 1993. *Paracorsia repandalis* D. & S., bred from mullein

collected Sept. 1992 at Valdevecar, Albarracín, Teruel, Spain, emerged June, 1993. *Conistra erythrocephala* D. & S., *ab ovis* two gravid females taken at Arlanzon, Burgos, Spain, May 1993, emerged September.

(c) Moths taken in France in July, 1993. From Col de Vars, Alpes-de-Haute-Provence: *Rhyacia latens* Hübn., *Eurois occulta* L., *Apamea rubrirena* Treits. From Esteng, Alpes Maritimes: *Udea maurinalis* W. P. Curtis (= *itysalis* Walk.), *Zygaena viciae* D. & S., *Z. loti* D. & S., *Ochropleura celsicola* Bell., *O. signifera* D. & S., *Chersotis alpestris* Boisd., *C. oreina* Dufay, *C. anatolica* Draudt, *Rhyacia latens*, *Eurois occulta*, *Apamea rubrirena*, *Syngrapha ain* Hochenwarth. From St Laurent-du-Pape, Ardèche: *Pyrois effusa* Boisd. From Collias, Gard: *Parahypopta caestrum* Hübn., *Harpyia milhauseri* F., *Hadena luteocincta* Ramb., *Cryphia algae* F. From Forêt de Tavel, Gard: *Parahypopta caestrum*, *Hadena luteocincta*, *Calophasia opalina* Esp. (= *casta* Borkh.). From Grotte de Baumes, Gorges du Gardon, Gard: *Apopestes spectrum* Esp. From Camp des Rochilles, Savoie: *Zygaena exulans* Hochen., *Arctia flavia* Fuess., *Euxoa culminicola* Stdgr., *Chersotis anatolica*, *C. ocellina* D. & S., *C. alpestris*, *Rhyacia latens*, *R. grisescens* F., *Xestia ochreago* Hübn., *Polia serratilinea* Treits.

(d) From Arlanzón, Burgos, Spain, May 1993: *Jodea croceago* D. & S., *Lithophane ornitopus* Hufn. (a very dark form).

(e) A display showing variation in *Noctua janthe* Borkh. and *N. janthina* D. & S., the former being the species known to occur in Britain. The two species can be separated fairly confidently on external features, both upperside and underside, but a critical examination of the genitalia is essential to be absolutely certain. A note discussing the value of the various features for distinguishing the two species was provided with the exhibit. Six British, two French and two Spanish specimens were shown.

HOARE, R. J. B.—A selection of microlepidoptera, including Pyralidae and Pterophoridae, collected during an Exeter University field trip to Bourg St Pierre, Valais, Switzerland, 25.vi–8.vii.1993. The species exhibited were as follows. Incurvariidae: *Lampronia rupella* D. & S., Bourg, by day, 1.vii; *Nematopogon robertella* Clerck, Valsorey, 3.vii. Psychidae: *Pseudobankesia alpestrella* Hein., male bred from cases collected on a rock-face, Bourg, 27.vi; *Bijugis bombycella* D. & S., male caught at dusk, Bourg, 27.vi. Bucculatrigidae: *Bucculatrix(?) absinthii* Gartner, two of several seen flying round *Artemisia absinthium* L., Bourg, 1.vii. Epermeniidae: *Ochromolopis icella* Hübn., Bourg, two by day, 27.vi; *Cataplectica devotella* Heyd., Bourg, two by day, 27.vi; *Epermenia scurella* H.-S., Bourg, one by day, 27.vi. Oecophoridae: *Schiffermuelleria similella* Hübn., a light and a dark specimen, Bourg, at m.v. light, 27.vi; *Depressaria silesiaca* Hein., two of six bred from larvae on *Artemisia absinthium*, Bourg; *Ethmia funerella* F., two second-brood specimens from larvae on *Symphytum officinale* L., collected at Delle, near Belfort, France, 7.vii. Gelechiidae: *Eulamprotes libertinella* Zell., Bourg, two at dusk, 1.vii; *Teleiopsis bagriotella* Dup., Valsorey, by day, 3.vii; *Chionodes perpetuella* H.-S., Bourg, at m.v. light, 3–4.vii; *Caryocolum interalbicella* H.-S., Valsorey, by day, 3.vii; *Sophronia semicostella* Hübn., Valsorey, by day, 3.vii; *S. humerella* D. & S., Valsorey, by day, 3.vii; *Acompsia tripunctella* D. & S., Bourg, afternoon, 27.vi. Cosmopterigidae: *Pancalia latreillella* Curt., Valsorey, by day, 3.vii. Scythrididae: *Enolmis acanthella* Godart (sens. lat.), one at rest on a wall, Chaumont, France, 7.vii. Tortricidae: *Sparganothis pilleriana* D. & S., Sion, by day, 2.vii; *Eana penziana* Thunb. & Beck., male taken on a rock-face, Bourg, 1.vii, female at m.v. light, 28.vi; *E. argentana* Clerck, two by day, 26.vi: this species was abundant around Bourg; *Apotomis sauciana* *grevillana* Curt., Bourg, by day, 26.vi; *Gypsonoma nitidulana* Lien. & Zell., Valsorey,

by day, 3.vii; *Cydia gemmiferana* Treits., Bourg, at dusk, 25.vi; *C. medicaginis* Kuznetsov, Langres, France, by day, 25.vi; *C. succedana* D. & S. F. *asseclana* Hüb., Valsorey, by day, 3.vii. Pyralidae: *Catoptria speculalis* Hüb., Bourg, at m.v. light, 27.vi; *C. margaritella* D. & S., Bourg, at m.v. light, 1–2.vii; *Gesneria centuriella* D. & S., male by day, 1.vi, female at m.v. light, Bourg, 4.vii; *Eudonia sudetica* Zell., male and female, Bourg, 25–26.vi; *E. valesialis* Dup., Valsorey, taken in afternoon on glacial moraine, 3.vii; *Metaxmeste phrygialis* Hüb., Bourg, by day, 27.vi and Valsorey, by day, 3.vii; *Pempeliella ornatella* D. & S., Bourg, at m.v. light, 26.vi; *Catastia marginata* D. & S., Bourg, by day, 27.vi; *Asaria aethiopella* Dup., Valsorey, by day on glacial moraine, 3.vii; *Panstegeia aerealis* Hüb., Bourg, by day and at m.v. light; *Sitochroa verticalis* L., Sion, by day, 2.vii; *Anania funebris* Strom, Bourg, by day, 27.vi; *Udea alpinalis* D. & S., Bourg, 25 & 29.vi, at dusk and at m.v. light; *U. nebulalis* Hüb., Bourg, at m.v. light, 26.vi; *U. rhododendronalis* Dup., Valsorey, 3.vii. Pterophoridae: *Platyptilia tesseradactyla* D. & S., Bourg, at m.v. light, 26.vi.

HOLLINGWORTH, T. S.—A selection of moths taken in southern France, the Pyrenees and Corsica, including several microlepidoptera as yet unidentified. Nearly all were caught in coastal or mountain habitats.

LUCKENS, C.—A selection of butterflies from Europe, captured or bred in 1992 and 1993. (i) Butterflies collected in the Cevennes, Hautes Pyrenees and Drome in late July 1993, including the local species *Agrodiaetus dolus vittatus* Oberth. (Cevennes) and *Ariades pyrenaicus* Boisd. (Pyrenees).

(ii) Three Cretan endemics: *Kretania psylorita* Freyer, *Coenonympha thyrsis* Freyer and *Zerynthia cretica* Rebel, all encountered during a week spent on the island in June 1993, at 1600 m on Mt Ida.

(iii) Black-veined white, *Aporia crataegi* L.: four specimens of the original Kentish butterflies; specimens from different localities in Europe, from low levels in Spain to 1500 m in Switzerland; a series of eight specimens reared from two batches of eggs found on *Crataegus* at c. 1400 m on Mt Chelmos, Peloponnese, Greece. The young larvae were overwintered in an unheated greenhouse but otherwise kept outdoors throughout. The resulting imagines were much larger than normal.

PARSONS, M. R.—A selection of Pyralidae from the Greek island of Paxos, taken in late August 1993, including *Agriphila inquinatella* D. & S., *Ancylolomia tentaculella* Hüb., *Hellula undalis* F., *Pyrausta purpuralis* L., *P. sanguinalis* L., *Anania verbascalis* D. & S., *Udea numeralis* Hüb., *Palpita unionalis* Hüb., *Dolicharthria punctalis* D. & S., *D. bruguieralis* Dup., *Hypsopygia costalis* F., *Pyralis regalis* D. & S., *Therapne obsoletalis* Mann., *Endotricha flammealis* D. & S., *Lamoria anella* D. & S. and *Ephestia? elutella* Hüb.

PING, G. & ROBINSON, G. S.—Dudgeonidae from Borneo. Dudgeonidae is a small family comprising the single genus *Dudgeonea* with nine species. Currently placed in the Coccoidea, dudgeonids resemble cossids but possess an abdominal tympanal organ. The genus is already known from Africa, Madagascar, NE India, W Malaysia, New Guinea and northern Australia, and has now been discovered in Borneo. Little is known of the biology of the group, but the Australian species *Dudgeonea actinias* was reared by F. P. Dodd and his findings were reported by Turner when describing the species. The larvae are stem-borers in *Canthium attenuatum* (Rubiaceae); just before pupation the larva excavates a tunnel to the outside bark, leaving only a thin layer of bark to cover the emergence hole. The pupa is protruded from the emergence hole through this operculum prior to emergence of the adult. Dudgeonids are generally extremely rare in collections. The species exhibited (Plate I, Figs 12 & 13) was collected by Glenn Ping at m.v. light at the edge of mangrove (*Rhizophora*) forest on the

northern shore of the Brunei River, north Borneo. The female is considerably larger than the male. The species is new to science and is closely related to *D. actinias* Turner from Queensland.

REVELL, R. J.—A selection of moths captured in Europe and Africa, the majority on the British List as rare residents, occasional migrants or species of dubious status. Ctenuchidae: *Syntomis phegea* L. and *Dysauxes ancilla* L. from Slovenia. Geometridae: *Scopula immorata* L. from Valais, Switzerland, *S. nigropunctata* Hufn. from France, *Peribatodes secundaria* Esp. and *Siona lineata* Scop. from Valais. Lasiocampidae: *Malacosoma castrensis* L. from French Pyrenees. Nolidae: *Nola chlamitulalis* Hübn. from SW France. Noctuidae: *Pachetra sagittigera* Hufn., *Eriopygodes imbecilla* F., *Syngrapha interrogationis* L. from Valais; *Athetis hospes* Freyer, *Eublemma purpurina* D. & S., *Acontia lucida* Hufn., *Dysgonia algira* L. from SW France; *Trachea atriplicis* L. and *Valeria jaspidea* de Vill. from France; *Helicoverpa armigera* Hübn. from Namibia.

ROBINSON, G. S., TRUCK, K. R. & SHAFFER, M.—A poster display depicting the compilation of material for a forthcoming *Field guide to the smaller moths of South-East Asia*, to be published in Malaysia by the Malaysian Nature Society early in 1994. The display included samples of text and of the colour and half-tone illustrations. Between 1981 and 1993, collections were made in Nepal, Thailand, W. Malaysia, Borneo (Brunei, Sabah, Sarawak), Sulawesi, Seram and New Guinea by members of staff of the British Museum (Natural History). More than 30,000 specimens were collected and details of host-plants, geographical and altitudinal range, morphology and variation were thus obtained. From over 7000 species obtained, a representative selection of 650 was made to include pest species, common and conspicuous species, representatives of the more diverse genera, and species for which information on life history was available.

Using modern desk-top publishing methods and high-quality camera-ready copy, the book will be made available in SE Asia at an affordable price. It will open up new areas of study in insect diversity by specialists and non-specialists in developing countries and will contribute substantially to awareness of small moths as an important component of tropical ecosystems.

WARING, P.—Two drawers of Sphingidae recorded between January 1981 and March 1983 at Nyany camp, Jonglei Province, southern Sudan. Nyany is an old Dinka cattle-camp some 80 km north of Bor and 10 km east of Jonglei village. It is an area of open grassland about 11 km east of the permanent swamp system of the Sudd, scattered with termite mounds. The few trees and shrubs present are mainly confined to the termitaria. A standard Robinson moth trap with 125 W m.v. bulb was operated most nights from dusk to around 2300 hrs, and nectariferous flowers were searched by day and at dusk. The exhibitor expressed his gratitude to Dr I. J. Kitching of the Natural History Museum, London for help in checking identifications and current nomenclature. The following species were shown. *Agrius convolvuli* L., *Acherontia atropos* L., *Xanthopan morgani* Walk., *Polyptychoides niloticus niloticus* Jordan, *Cephonodes hylas virescens* Wallengren, *Daphnis nerii* L., *Nephele vau* Walk., *N. comma* Hopffer including *F. derasa* Rothschild & Jordan, *N. peneus* Cram. (only seen in Juba, capital city of southern Sudan), *N. accentifera* Palisot de Beauvois, *Hyles livornica* Esp., *Basiothia medea* F., *Euchloron megaera* L., *Hippotion osiris* Dalman, *H. celerio* L., *H. eson* Cram., *H. balsaminae* Walk., *H. rebeli* Rothschild & Jordan, *Macroglossum trochilus* Hübn (seen near Gilo in the Imatong Mts), *Sataspes infernalis* Westw., a carpenter bee mimic (Plate I, Fig. 14).

DIPTERA

ALEXANDER, K. N. A. & FOSTER, A. P.—A selection of flies found during the National Trust's biological survey of North Wales in 1993. *Oxycera morrisii* Curt., Pistyll Farm, Lleyn, 27.vii; *O. nigricornis* Ol., Erddig, 28.vi, new to Wales; *O. pygmaea* (Fall.), Mynydd Bychestyn, Lleyn, 13.vii; *O. rara* (Scop.), Big Wood, Erddig, 24.vi; *O. trilineata* (F.), Porth Gwylan, Lleyn, 15.vii; *Vanoyia tenuicornis* (Macq.), Big Wood, Erddig, 24.vi, new to Wales (above all Stratiomyidae); *Dioclea oelandica* (L.) (Asilidae), Dolmelynlyn, Merioneth, 10.vi; *Scenopinus niger* (Deg.) (Scenopinidae), Big Wood, Erddig, 24.vi; *Microdon mutabilis* (L.) (Syrphidae), Dolmelynlyn, 9.vi; *Oxyna nebulosa* (Wied.) (Tephritidae), Penmachno, Caerns., 22.vii; *Herina lugubris* (Meig.) (Otitidae), moist soft rock cliffs on Lleyn; *Pelidnoptera fuscipennis* (Meig.) (Phaeomyiidae), various woodland sites; *Dictya umbrarum* (L.) (Sciomyzidae), Cregennan, 21.vi; *Tetanocera punctifrons* Rond. (Sciomyzidae), Cregennan, 21.vi.

BALL, S. & MORRIS, R.—An exhibit describing the current state of progress in the Hoverfly Recording Scheme (Syrphidae). The database contains 181,000 records from 1992 10 km squares (out of 2850 containing land in Britain). A provisional atlas is expected to be published by the Biological Records Centre in 1996. Examples of maps, phenology and selected species accounts were shown, illustrated by photographs of flies and their habitats.

BLAND, K. P.—(a) *Cerodontha lutzulae* (Groschke) (Agromyzidae), recently recognized as new to Britain, but proving widespread on *Luzula sylvatica* (Hudson) Gaudin: Portmore, Peebles, collected 26.iii.1988, emerged 31.v.1988; Aikieside Wood, Ber., collected 3.iii.1990, emerged 6.vi.1990.

(b) *Botanophila depressa* (Stein) (= *Pegohylemyia oraria* Collin), Malaclete, North Uist, reared from *Suaeda maritima* (L.) Dumort. collected 13.vii.1992, emerged 9–17.v.1993.

CHANDLER, P. J.—(a) A selection of flies collected in 1993 at Dinton Pastures Country Park, with a map of the Park to show the main habitats. *Nigrotipula nigra* (L.) (Tipulidae), remnant water meadow at south end of Mortimer's Meadow, 26.vi; *Sphaeromias fasciatus* (Meig.) (Ceratopogonidae), common around lakes, v-vi; *Macrocerca crassicornis* Winn. (Keroplatidae), hedge south of Black Swan Lake, 21.ix; *Megophthalmidia crassicornis* (Curt.) (Mycetophilidae), on young alders, Tufty's Corner, 23.v; *Chorisops nagatomii* Rozkosny (Stratiomyidae), on oaks south of Black Swan Lake, 21.viii; *Rhamphomyia lamellata* Collin (Empididae), Sandford Copse, 31.vii; *Epistrophe diaphana* (Zett.) (Syrphidae), south end of Mortimer's Meadow, 26.vi; *Euphranta toxoneura* (Loew) (Tephritidae), on sallows in Sandford Copse, 8.v. and by River Loddon, 8.vi; *Oxyna parietina* (L.) (Tephritidae), between lakes 13.vi. and the scarcer *O. nebulosa* (Wied.), same area, 22.vi.1983; *Trigonometopus frontalis* (Meig.) (Lauaxiidae), Mortimer's Meadow, 8.v; *Astiosoma rufifrons* Duda (Asteiidae), at cold bonfire ash at edge of Sandford Copse, 26.vi; *Agromyza ferruginosa* Wulp (Agromyzidae), Mortimer's Meadow, 31.vii; *Gaurax fascipes* (Becker) (Chloropidae), by river Loddon, 26.vi, 8.viii; *Norellia spinipes* (Meig.) (Scathophagidae), on sallows, Mortimer's Meadow, 7.vii; although its food plant (*Narcissus*) is absent from the area; *Piezura boletorum* (Rond.) (Fanniidae), carr at south end of Mortimer's Meadow, 17.vi; *P. graminicola* (Zett.), Sandford Copse, 31.vii, for comparison; *Myopina myopina* (Fall.) (Anthomyiidae), margin of Sandford Lake, 15.viii; *Botanophila gnava* (Meig.) (Anthomyiidae), the lettuce seed fly, frequent in Mortimer's Meadow, vi-vii, where *Lactuca serriola* L. is a possible food plant.

(b) 28 species of snail-killing flies (Sciomyzidae) found at Dinton Pastures, with comments on their biology. In addition to the 3 notable species exhibited by Ian McLean in 1992, *Pherbellia griseola* (Fall.), *Colobaea bifasciella* (Fall.) and *Pteromicra pectorosa* (Hendel) were found in 1993; all 6 notable species were found by Mungell's Pond which supports at least 13 species of the family.

(c) *Homoneura biumbrata* (Lowe) (Lauxaniidae), new to Britain from Dinton Pastures: male, 23.v and both sexes, 31.vii, on sallows of small copses on Mortimer's Meadow (females had been found at Brent Reservoir, Middlesex, 22.vi.1991 but hitherto confused with *H. tesquae*); also shown *H. subnotata* Papp and *H. thalhammeri* Papp collected with it on 31.vii; larvae of this genus mine decaying leaves of trees, especially sallows and poplars.

(d) *Sphaeromias pictus* (Meig.) (Ceratopogonidae), new to Britain from Old Slade Woods, Bucks., 4.viii.1977 and Old Buckenham Fen, Norfolk, 11.vii.1993; also found at Runnymede ponds, Surrey. The two known British species also exhibited.

(e) *Dynatosoma thoracicum* Zett. *sensu* Landrock (Mycetophilidae), second British specimen, female from Bucklebury Common, Berks., 6.vi.1993; a male was found at the same site by Alan Stubbs, 12.vii.1989; it is very distinctive, entirely orange-bodied with brown-banded wings, but species group needs revision before formal admission to British list.

GODFREY, A.—A selection of uncommon flies collected in 1993. *Ctenophora flaveolata* (F.) (Tipulidae), Bix Bottom, Oxon, 13.iv, male on beech trunk; *Odontomyia angulata* (Panz.), *Stratiomys singularior* (Harris) (Stratiomyidae) and *Eutolmus rufibarbis* (Meig.) (Asilidae), Thompson Common, Norfolk, 6.vii; *Hybomitra expollicata* (Pand.) (Tabanidae), Iwade Marshes, Kent, 24.vi; *Villa modesta* (Meig.) (Bombyliidae), Holkham dunes, Norfolk, 8.vii; *Lejops vittata* (Meig.) (Syrphidae), Iwade Marshes, 24.vi; *Myopites eximia* Séguy (Tephritidae), The Swale, Isle of Sheppey, Kent, 25.vi; *Geomyza breviseta* (Czerny) (Opomyzidae), in tussocky grassland at Dunstable, Beds., 6.x; *Stenomicra delicata* (Collin) (Aulacigastridae), on *Carex paniculata* L., Barnby Marshes, Suffolk, 7.vii; *Aecothea praecox* Loew (Heleomyzidae), in rabbit holes at several sites, shown from Risby Warren, Lincs., 29.vi; *Siphonella oscinina* (Fall.) (Chloropidae), Brentwood, Essex, 16.viii; *Dicraeus scibilis* Collin (Chloropidae), The Swale, Isle of Sheppey, 25.vi, frequent in brackish ditches in 1993; *Trixoscelis marginella* (Fall.) (Trixoscelidae), inland sandy path, Rauceby Warren, Lincs., 20.vi.

HALSTEAD, A.—Some local species found in 1993: *Oxycera morrisii* Curt. (Stratiomyidae), wet meadow at Hoe Rough, near Beetley, Norfolk, 6.vii; *Atylotus latistriatus* (Brauer) (Tabanidae), sand dunes, Holkham Bay, Norfolk, 7.vii; *Ogcodes pallipes* Lat. (Acroceridae), edge of meadows north of Calthorpe Broad, Norfolk, 8.vii; *Xylophagus ater* Meig. (Xylophagidae), *in copula* on beech trunk, Abinger Rough, Surrey, 12.vi; *Choerades marginata* (L.) (Asilidae), Foxley Wood, Norfolk, 6.vii; *Myopa tessellatipennis* Mots. (Conopidae), ride of chalk woodland at Therfield Heath, near Royston, Herts., 4.v.; *Melieria picta* (Meig.) (Otitidae), saltmarsh near Titchwell RSPB Reserve, Norfolk, 7.vii; *Icterica westermannii* (Meig.) (Tephritidae), Sandford Lake, Dinton Pastures, Berks., 25.vii; *Urophora solstitialis* (L.) (Tephritidae), on *Carduus nutans* L. near Hopton Fen, Suffolk, 11.vii; *Pherbellia griseola* (Fall.) (Sciomyzidae), Upton Broad Fen, Norfolk, 10.vii; *Sciomyza simplex* Fall., Catfield Fen, Norfolk, 8.vii; *Dichetophora finlandica* Verbeke (Sciomyzidae), near fresh water lake on Kenfig Burrows, Glam., 27.iv; *Ornithomyia avicularia* (L.) (Hippoboscidae), on collector's arm, Royal Horticultural Society Gardens at Wisley, Surrey, 23.vi.

HODGE, P. J.—Flies found in Sussex in 1993: *Pelecocera tricincta* Meig. (Syrphidae), St Leonard's Forest, West Sussex, 31.vii, swept off *Molinia* in heathy

woodland ride, new county record; *Rhingia rostrata* (L.) (Syrphidae), Streatfield Wood near Brede, East Sussex, 27.viii., one female; *Acinia corniculata* (Zett.) (Plate I, Fig. 8) (Tephritidae), Chailey Common, East Sussex, 19.viii., two females swept off *Centaurea nigra* L. in tiny area of unimproved grassland at edge of common (currently known from 3 sites in East Anglia with a few old records scattered in southern England).

MILES, S. R.—*Asilus crabroniformis* L. (Asilidae), from a new site in west Hants.; *Caliprobola speciosa* (Rossi), hovering around very crumbly base of an old beech tree at Bishopsgate in eastern part of Windsor Forest, Berks.

PLANT, C. W.—*Nephrocerus scutellatus* Macq. (Pipunculidae), from M25 Motorway southern embankment, TQ3652, Surrey, Malaise trap, 27.v–13.vi.1993, which produced 1 male and 170 females; another trap 1 km west produced 26 females. Both traps were near areas of oak scrub which it is known to frequent in Europe where it is thought to parasitize froghoppers of the genus *Mesembrius*; only two previous British records of the fly, King's Park Wood, Sussex and Selborne Common, Hants. (both Alan Stubbs), accounting for its RDB 1 status, queried by the exhibitor as many European records were from Malaise traps and it was also possibly nocturnal.

COLEOPTERA

ALEXANDER, K. N. A.—Three rare beetles taken in Gloucestershire during summer 1993; all are new localities. *Lissodema cursor* (Gyll.), one from ash woodland on Sedbury Cliff, 15.viii.1993, 2nd county record; *Osphya bipunctata* (F.), one from hawthorn blossom, Chedworth Woods, 31.v.1993; *Grammoptera ustulata* (Schall.), one beaten from oak foliage, Coombe Hill Canal, 15.v.1993.

ALEXANDER, K. N. A. & FOSTER, A. P.—A selection of the more interesting beetles found during the National Trust's Biological Survey 1993 visit to North Wales. The Border parks of Erddig and Chirk Castle, Denbighshire, and also the seacliffs on the Lleyn Peninsula, Caernarvonshire, feature strongly. Those species believed to be new to Wales are marked with an asterisk. *Agabus affinis* (Payk.), Dolmelynlyn Estate, Mer., 9.vi.1993; *Quedius ventralis* (Aragona), from sap-run on horse chestnut, Erddig Park, 28.vi.1993; *Geotrupes vernalis* (L.), one on coastal heathland, Mynydd-y-Graig, Lleyn, 16.vii.1993; *Amphimallon ochraceum* (Knoch), frequent at Pen-y-Cil, Lleyn, 14.vii.1993, and noted elsewhere on the Peninsula; *Prionocyphon serricornis* (Müller, P. W. J.), swept in Big Wood, Erddig, 24.vi.1993, new to N. Wales; *Sericus brunneus* (L.), Dolmelynlyn, 9.vi.1993; *Malthinus frontalis* (Marsh.), swept in Big Wood, Erddig, 24.vi.1993, the 3rd Welsh record; **Dorcatoma serra* Panz., one tapped from *Inonotus dryadeus* bracket fungus on old oak at Chirk, 19.vii.1993; *Thymalus limbatus* (F.), from pasture-woodland, Dolmelynlyn Estate, Mer. 9.vi.1993; **Cryptarcha strigata* (F.), Chirk, 19.vii.1993; *Eledona agricola* (Herbst), abundant in *Laetiporus sulphureus* bracket fungus on old oak, Chirk, 19.vii.1993, new to N. Wales; **Prionychus ater* (F.), Chirk and Erddig; **Abdera quadrisfasciata* (Curt.), one from dead lower limb of old oak at Chirk, 19.vii.1993; *Donacia thalassina* Germ., Llynnau Cregennan, Mer., 22.vi.1993; *Cryptocephalus aureolus* Suff., from seacliff grassland, Trwyn y Ffosle, Lleyn, 8.vii.1993; *Sibinia arenariae* Steph., from rock-spurrey, Mynydd Bychestyn, Lleyn, 13.vii.1993, new to N. Wales.

BOOTH, R. G.—*Longitarsus longisetosa* Weise from a heathy woodland clearing in East Sussex. A single female was swept in 1992; in 1993 numerous examples were found on common speedwell, *Veronica officinalis* L. which is undoubtedly the host plant at this site. Formerly known as British from a single male collected in Kent in 1951 by Mr A. A. Allen who described it in 1967 as *Longitarsus clarus*.

COLLIER, M.—(1) Some notable Norfolk Coleoptera, including four new county records (*). *Acupalpus consputus* (Duft.), Stanford MOD, 22.ix.1993. **Perigona nigriceps* (Dej.), Rockland St Peter, 23.ix.1993, in garden compost heap. **Scydmaenus rufus* M. & K. and **Scrapta testacea* Allen, Santon Downham, adults found emerged on 29.vi.1993 from rotten alder collected 6.ii.1993. *Tachinus flavolimbatus* Pand., Caudlesprings, Watton, 10.ix.1993, sieving fen/meadow cuttings. *Soronia punctatissima* (Ill.), Surlingham, 4.vii.1993, first modern county record. **Uleiota planata* (L.), Stanford MOD, 22.ix.1993, under bark of birch log. *Tetratoma desmaresti* (Lat.), Stanford MOD, 10.iv.1992, beating branches of dead standing oak, first modern county record. *Tropiphorus terricola* (Newm.), Stanford MOD, 5.vi.1993, evening sweeping. *Hypera dauci* (Ol.), Stanford MOD, 16.v.1992, pair in cop crawling outside rabbit burrow, near *Erodium*.

(2) French specimens of beetles now considered very rare or extinct in Britain. *Diachromus germanus* (L.) and *Brachinus sclopeta* (F.), Burcin, 18.v.1993, in wet meadow beside reed fen., *Platycerus caraboides* (L.), Forêt de la Cantinière, 19.v.1993, on umbel in forest meadow. *Trichodes alvearius* (F.), Charnay, 14.v.1993, common on roadside umbels. *Hippodamia 13-punctata* (L.), Etang Fontain, St Eloi, 10.ix.1991, sweeping lakeside vegetation. *Acmaeops collaris* (L.), Forêt de la Cantinière, 19.v.1993, on hawthorn blossom in forest clearing. *Agelastica alni* (L.), Grenoble, 17.v.1993, crawling up trunk of poplar.

COPESTAKE, D. R.—Some interesting beetles found during 1993. *Elaphrus uliginosus* F., Lucombe Chine, I.o.W., 24.iv.1993; *Bembidion obliquum* Sturm, Powdermill Reservoir, East Sussex, 21.ix.1993; *Platyderus ruficollis* (Marsh.), Horsell Common, Surrey, 11.viii.1993, under log; *Harpalus melleti* Heer and *H. schaubergerianus* Puel, near Cheam Golf Course, Surrey, 11.viii.1993, in moss; *Badister bullatus* (Schr.), *B. meridionalis* Puel and *B. unipustulatus* Bon., Otmoor, Oxfordshire, 27.x.1993, all three species in same grass tussock; *Odacantha melanura* (L.), Pevensey Level, East Sussex, 15.iv.1993, in reed litter; *Lacon querceus* (Herbst), Windsor, Berkshire, 21.viii.1993, beating oak; *Ampedus cardinalis* (Schiöd.), Windsor, Berkshire, vi.1993, bred; *A. pomorum* (Herbst), Brocton Coppice, Staffordshire, 24.iii.1993, in birch log; *A. nigerrimus* (Lac.), Windsor, Berkshire, 20.ii.1993, in red-rotten oak log; *Ischnodes sanguinicollis* (Panz.), and *Procræterus tibialis* (Boisd. & Lac.), Windsor, Berkshire, 17.v.1993, on hawthorn blossom; *Megapenthes lugens* (Redt.), Windsor, Berkshire, 17.v.1993, in baited trap; *Ischnomera sanguinicollis* (F.) and *Grammoptera ustulata* (Schall.), Windsor, Berkshire, 17.v.1993, on hawthorn blossom; *Chrysolina sanguinolenta* (L.), near Cheam Golf Course, Surrey, 11.viii.1993, in moss; *Platystomos albinus* (L.), Crump's Wood, Little Horsted, East Sussex, 16.iv.1993, in moss; *Brachytarsus nebulosus* (Forst.), Windsor, Berkshire, 3.vi.1993, beating oak; *Otiorrhynchus raucus* (F.), near Cheam Golf Course, Surrey, 11.viii.1993, in moss; *Cathormiocerus myrmecophilus* (Seidlitz), Ecclesbourne Cliff, Hastings, East Sussex, 14.iv.1993; *C. socius* Boh. Red Cliff, Sandown, I.o.W., 24.iv.1993; *Brachysomus echinatus* (Bons.), Oakley Wood, Cirencester, Gloucestershire, 23.v.1993, swept; *Cneorhinus plumbeus* (Marsh.) and *Tanygnathus palliatus* (F.), Eype Mouth, Dorset, 12.vi.1993, swept; *Limobius borealis* (Payk.), Huish, Wiltshire, 6.vi.1993, on *Geranium pratense* L.; *Magdalisa barbicornis* (Lat.), near Waterperry Wood, Oxfordshire, 8.vi.1993; *Trachodes hispidus* (L.), Crump's Wood, Little Horsted, East Sussex, 16.iv.1993, in moss; *Cryptorhynchus lapathi* (L.), Merthyr Mawr Warren, Glamorgan, 21.v.1993, on poplar; *Acalles roboris* Curt., Crump's Wood, Little Horsted, East Sussex, 16.iv.1993, in moss; *Bagous collignensis* (Herbst), Balmer Lawn, Brockenhurst, South Hampshire, 7.vi.1993, on muddy pond bank; *B. glabrirostris* (Herbst), Pevensey Level, East Sussex, 15.iv.1993, in reed litter;

Procas granulicollis Walton, near Rhyader, Radnorshire, 21.iii.1993, in bracken litter; *Orthochaetes insignis* (Aubé), The Crumbles, Eastbourne, East Sussex, 15.iv.1993; *Rhinoncus albicinctus* Gyll., Powdermill Reservoir, East Sussex, 21.ix.1993, sweeping *Polygonum*; *Tapinotus sellatus* (F.), Virginia Water, Berkshire, 3.vi.1993; *Ceutorhynchus hirtulus* Germ., Merthyr Mawr Warren, Glamorgan, 21.v.1993; *Calosirus terminatus* (Herbst), and *Trichosirocalus barnevillei* (Gren.), near Cheam Golf Course, Surrey, 11.viii.1993, in moss; *Sibinia potentillae* Germ., Great Ovens Hill near Wareham, Dorset, 6.vi.1993; *S. sodalis* Germ., Gilkicker Point near Gosport, South Hampshire, 12.v.1993; *Taphrorychus bicolor* (Herbst), Knole Park near Sevenoaks, West Kent, 20.ii.1993, under beech bark.

HACKETT, D.—(1) A detailed record of new sites for *Agrilus pannonicus* (Pill. & Mitt.) discovered in North London during 1993, including a sketch map. Unless otherwise stated the following records are for sightings of emergence holes in oak bark: Hampstead Heath, TQ276863, TQ272876, TQ261874; Queen's Woods, TQ295886, on >25 trees (+adults); Highgate Wood, TQ283887, on >6 trees (+adult); Cherry Tree Wood, TQ276891, on >3 trees; Alexandra Palace Park, TQ300900, on >3 trees; Coldfall Wood, TQ277903, on >3 trees; Arnos Park, TQ296927, on 3 trees; Broomfield Park, TQ305928, on 1 tree; Grovelands Park, TQ308944, on >2 trees; Trent Park, TQ290975, on >1 tree; Monken Hadley Common, TQ262972, on >1 tree; Totteridge Green, TQ250938, on 1 tree. Specimens exhibited were as follows: larva from an oak stump created by coppicing in February 1992 in Queen's Woods, emergence holes were observed in July 1993; Highgate Wood, 27.iv.1993, dead adult from emergence hole; Richmond Park, Surrey, 3.vii.1993, two adults from oak trunks; Queen's Woods, 5.v.1993, four adults reared from bark samples from an oak stump; Queen's Woods, 28.ii.1993, oak bark sample with three emergence holes; Queen's Woods, 25.x.1993, oak trunk rubbing after removal of bark, showing larval galleries.

(2) New site records for *Agrilus sinuatus* (Ol.), mainly from North London. All but one of the following records are based on observations of emergence holes in bark of *Crataegus* species: Tottenham Cemetery, TQ334911, on *C. × levallei* (hybrid) on 6 trees (+adult); Hampstead Heath, TQ276863, TQ261874; Primrose Hill, TQ276838, on 1 tree; junction of Wellesley Road/Chaseley Drive, Chiswick, TQ197783. Specimens exhibited were as follows: Tottenham Cemetery, 5.vii.1993, small branch and bark samples of *C. × levallei* (hybrid) showing larval mines and emergence holes, also a dead adult from an emergence hole; Richmond Park, Surrey, 3.vii.1993, adult beaten off *Crataegus* spp. by M. S. Parsons; bark samples from *Crataegus* spp. at Bookham Common, Surrey and Wellesley Road, Chiswick were also exhibited.

(3) *Prionychus ater* (F.), Richmond Park, Surrey, 3.vii.1993, on damaged hawthorn; *Phloiotrya vaudoueri* Muls., Coldfall Wood, North London, 18.vii.1993, under dead oak bark.

HALSTEAD, A. J.—Some local Coleoptera taken in 1993. *Lampyris noctiluca* (L.), Woodbastwick Fen., East Norfolk, 7–9.vii.1993, malaise trap; *Hyperaspis pseudopustulata* Muls., Horton, South Gower coast, Glamorgan, 24.iv.1993, swept off cliff-top vegetation; *Cteniopus sulphureus* (L.), East Wretham Heath, West Norfolk, 4.vii.1993, swept; *Meloë proscarabaeus* L., Horton, south Gower coast, Glamorgan, 24.iv.1993, crawling on cliff-top turf; *Phytoecia cylindrica* (L.), Sandford Lake, Dinton Pastures Country Park, Winnersh, Berkshire, 19.vi.1993, swept from lakeside vegetation; *Plateumaris braccata* (Scop.), Upton Broad Fen, East Norfolk, 10.vii.1993, swept off *Phragmites*; *Podagrica fuscicornis* (L.), Royston, Hertfordshire, 3.vii.1993, eating garden hollyhock leaves; *Notaris scirpi* (F.), White Swan Lake, Dinton Pastures

Country Park, Winnersh, Berkshire, 5.vi.1993, swept from lakeside vegetation; *Grypus equiseti* (F.), Whiteford Burrows, Gower Peninsula, Glamorgan, 23.iv.1993, swept in boggy meadow; *Hadropontus trimaculatus* (F.), East Wretham Heath, West Norfolk, 11.vii.1993, on *Carduus nutans* L.; *Xyleborus dispar* (F.), Whatlington, East Sussex, 2.ix.1993, in dead branch of *Elaeagnus angustifolia*.

HAWKINS, R. D.—Two species of Coleoptera taken in Surrey during 1993. *Malthinus balteatus* Suff., Nonsuch Park, Cheam, Surrey, 4.vii.1993, beaten from oak; *Nephus quadrimaculatus* (Herbst), Egham, Surrey, 5.ix.1993, one specimen beaten from a roadside oak.

HEAL, N. F.—36 species of British Coleoptera, mostly from Kent, taken between 1984 and 1993. New species for Kent are indicated with an asterisk (*). *Bembidion octomaculatum* (Goeze), Powdermill Reservoir, E. Sussex, TQ7920, 3.ix.1993; *Tachys bistriatus* (Duft.), Aldington, E. Kent, TR0638, 15.x.1993; *T. parvulus* Dej., Canterbury, E. Kent, TR1559, 8.vi.1985; *T. scutellaris* Steph., Chetney Marshes, E. Kent, TQ8869, 20.iv.1992; *Perigona nigriceps* (Dej.), Epsom Downs, Surrey, TQ2157, 5.x.1993; *Coelambus nigrolineatus* (von Steven), Aldington, E. Kent, TR0737, 28.xi.1990; **Acrulia inflata* (Gyll.), Lamberhurst, W. Kent, TQ6737, 26.ix.1991; *Carpelimus foveolatus* (Sahl.), Oare Marshes, E. Kent, TR0164, 5.iii.1993; **C. lindrothi* Palm, Tonbridge, W. Kent, TQ5645, 4.ii.1990; *Achenium humile* (Nico.), Wittersham, E. Kent, TQ8728, 14/19.i.1993; **Trichiusa immigrata* Lohse, Higham Marshes, W. Kent, TQ7075, 3.v.1992, first British record; Wittersham, E. Kent, TQ8728, 14.i.1993; Faversham, E. Kent, TR0260, 13.vi.1993; Epsom Downs, Surrey, TQ2157, 6.ix.1993; *Ilyobates nigricollis* (Payk.), Brede, E. Sussex, TQ7920, 3.ix.1993; *Homoeusa acuminata* (Märk.), Bredhurst, E. Kent, TQ8061, 26.iv.1990; *Aphodius lividus* (Ol.), Hoo, W. Kent, TQ8173, 29.vi.1987; *Agrilus sinuatus* (Ol.), Darenth, W. Kent, TQ5672, 6.viii.91/15.vii.1992; *Rhyzopertha dominica* (F.), Aylesford, W. Kent, TQ7459, 1.x.1991/7.iii.1992, bred, ex. rice bran; *Tenebroides mauritanicus* (L.), Faversham, East Kent, TR0161, 22.x/6.xi.1990, 25.iv/8.ix.1991, bred; *Epuraea distincta* (Grim.), Ham Fen, E. Kent, TR3355, 9.vi.1991; *Uleiota planata* (L.), Strood, W. Kent, TQ7368, 11.vii.1988; Leybourne, W. Kent, TQ6959, 8.x.1991; **Atomaria scutellaris* Mots., Aldington, E. Kent, TR0737, 28.xi.1990; Northbourne, E. Kent, TR3458, 20.vii.1991; Wittersham, E. Kent, TQ8728, 16.xii.1992; *Triplax lacordairii* Crotch, Ham Street, E. Kent, TQ9835, 30.vi.1990; *Nephus quadrimaculatus* (Herbst), Darenth, W. Kent, TQ5672, 17.ix.1991, 29.vii/14.viii.1992; West Malling, W. Kent, TQ6857, 26.ix.1992; *Platynaspis luteorubra* (Goeze), Darenth, W. Kent, TQ5772, 14.viii.1991; *Corticeus linearis* (F.), Oxshott Common, Surrey, 12.vii.1993; *Mordellistena nanuloides* Ermisch, Hoo Saltmarsh, W. Kent, TQ7971, 21.vi.1989; *Anthicus bifasciatus* (Rossi), Grain, W. Kent, TQ8975, 14.v.91; *Choragus sheppardi* Kirby, Darenth, W. Kent, TQ5672, 6.viii/30.ix.1991; *Brachysomus hirtus* (Boh.), Boxley, E. Kent, TQ7560, 25.ii.1987; Lyminge Forest, E. Kent, TR1051, 20.iv.1990; **Sitona puberulus* Reitt., Lamberhurst, W. Kent, TQ6638, 4.x.1991/13.x.1992; **Lixus scabricollis* Boh., Grain, W. Kent, TQ8975, 16.viii/13.ix.1987, first British record; *Magdalisa memnonia* (Gyll.), Oxshott Common, Surrey, TQ1461, 12.vii.1993; *Cossonus parallelepipedus* (Herbst), Chetney Marshes, E. Kent, TQ8869, 22.v.1991; *Gymnetron villosulum* Gyll., Newington, E. Kent, TQ8665, 22.v.1990; Barnes Cray, W. Kent, TQ5274, 30.viii.1993; *Rhynchaenus populi* (F.), Stodmarsh, E. Kent, TR2260, 14.x.1984; Graveney, E. Kent, TR0363, 6.vii.1986; Lower Halstow, E. Kent, TQ8567, 23.v.1993; **R. pseudostigma* Temperè, Chiddingstone, W. Kent, TQ5147, 18.vii.1993; *R. testaceus* (Müller, O. F.), Ham Fen, E. Kent, TR3355, 9.vi.1991.

HOARE, D. I. B.—(1) Seven species of Longhorn beetle (Cerambycidae) taken in Britain during 1992 and 1993. *Rhagium bifasciatum* F. var. *ictericum* Schleicher

(=var. *andreae* Vill.), New Forest, South Hampshire, 3.vi.1992, on beech log; *Grammoptera variegata* (Germ.), Brockenhurst, South Hampshire, 20.vi.1993, swept in woodland ride; *Leptura fulva* Deg., Totton, South Hampshire, 18.vii.1992, on *Cirsium* flower; *L. sexguttata* F., Brockenhurst, South Hampshire, 20.vi.1993, on *Galium* sp. in woodland; *Anaglyptus mysticus* (L.), Lower Ashton, South Devon, 12.vi.1993, on *Allium ursinum* L.; *Acanthocinus aedilis* (L.), Abernethy Forest Sawmill, Easterness, 27.v.1992; *Phytoecia cylindrica* (L.), Tiverton, South Devon, 1.v.1993, on umbellifer stem.

(2) Four species of Longhorn beetle (Cerambycidae) taken in France or Switzerland in summer 1993. *Oxymirus cursor* (L.), Bourg-St-Pierre, Switzerland, 30.vi.1993, in coniferous woodland; *Gaurotes virginea* (L.), Bourg-St-Pierre, Switzerland, 29.vi.1993, on flower; *Monochamus sutor* (L.), Bourg-St-Pierre, Switzerland, vii.1993, in flight; *Oberia oculata* (L.), Langres, France, 25.vi.1993, on *Salix* sp.

HODGE, P. J.—Eleven species of British Coleoptera taken during 1993. Species new to the county of Sussex are prefixed with an asterisk (*). **Ilybius aenescens* Thoms., North Park Wood, W. Sussex, TQ0515, 21.viii.1993, in acidic pond; **Limnebius crinifer* Rey, near Bexhill, E. Sussex, TQ71, 24.vii.1993, the second British site; *Gauropterus fulgidus* (F.), Epsom Downs, Surrey, TQ2257, 6.ix.1993, in old straw; *Philonthus corvinus* Er., Bure Marshes NNR, E. Norfolk, TG3316, 5.vii.1993; **Trichiusa immigrata* Lohse, Lancing, W. Sussex, TQ1906, 15.v.1993, in cut grass in an old chalk-pit, a recent immigrant now established in south-east England; *Malthodes crassicornis* (Mäklin), Ashtead Common, Surrey, TQ1659, 22.v.1993; **Mordellistena humeralis* (L.), Copthorne Common, E. Sussex, TQ3239, 17.viii.1993, one on *Angelica umbel*; *Synchita humeralis* (F.), Holme Fen, Cambridgeshire, TL2089, 29.vi.1993, one beaten from dead alder twigs; **Apion rubiginosum* Grill, Chapel Common, W. Sussex, SU8228, 14.viii.1993, swept off short herbage; *Sitona waterhousei* Walton, Chapel Common, W. Sussex, SU8228m, 14.viii.1993, swept off short herbage; **Mogulones euphorbiae* (Bris.), Chapel Common, W. Sussex, SU8228, 14.viii.1993, two males swept off short herbage.

JAMES, T. J.—A selection of Coleoptera from Hertfordshire, including several species which appear previously unrecorded from the county; these are prefixed with an asterisk (*). *Hydrochus angustatus* Germ., Broxbourne Wood, 8.viii.1993, in pond; *Cercyon terminatus* (Marsh.), Ashwell, 14.ii.1993, in compost; **Aclypea opaca* (L.), Tingley Wood, Pirton, 11.vi.1993, on ground; *Scydmaenus rufus* Müller, P. W. J. & Kunze, Panshanger Park, 7.vi.1992, in rotten pine log; **Carpelimus zealandicus* (Sharp), Amwell Quarry, 5.viii.1987, in detritus by lake; *Anotylus insecatus* (Grav.), Ashwell, 11.vii.1988, in house; **Stenus niveus* Fauv., Croxley Moor, 19.vii.1992, taken by R. Gade; *Quedius scitus* (Grav.), Panshanger Park, 17.vi.1990, on old oak; **Q. xanthopus* Er., Ashwell, 23.iv.1987, in house; **Sepedophilus testaceus* (F.), Nuthampstead, 19.v.1986, on rotten beech log; *Chaetophora spinosa* (Rossi), Oxshott Hill, Benington, 2.vii.1990, at roots of mignonette; *Agrius laticornis* (Ill.), Broxbourne Woods, 4.viii.1991, on young oak; *A. pannonicus* (Pill. & Mitt.), Cowheath Wood, 21.vi.1992, one of several recent Herts. records; **Hemicoelus nitidus* (Herbst), Danemead, Broxbourne Woods, 4.viii.1991, beaten from scrub; *Tillus elongatus* (L.), Broxbourne Common, 21.vi.1992, on old oak; **Pocadius lanuginosus* Franz, Panshanger Park, 20.x.1991, in fungus; **Dienerella filiformis* (Gyll.), Baldock, 5.xii.1985, in building; **Alphitobius diaperinus* (Panz.), Ashwell, 14.viii.1990, in house; *Lissodema cursor* (Gyll.), Chapmore End, 30.vi.1988, on ground by roadside hedge; *Mordellistena humeralis* (L.), Whippendell Wood, 29.vii.1990, on hogweed; *Ischnomera cyanea* (F.), Northe Wood, Anstey, 28.v.1992, on guelder rose flower; *Phytodecta olivacea* (Forst.), Hertford Heath, 26.vi.1988, on broom; **Epitrix*

pubescens (Koch), Frogmore Gravel-pit, Aston, 25.vii.1986, swept; *Rhynchites longiceps* Thoms., Broxbourne Wood, 21.vi.1992, in flight; *Byctiscus populi* (L.), Broxbourne Wood, 21.vi.1992, on young aspen; **Apion rubiginosum* Grill, Croxley Moor, 19.vii.1992, on sheep's sorrel; **A. immune* Kirby, Croxley Moor, 19.vii.1992, on broom; *A. gyllenhali* Kirby, Fox Covert, Therfield, 14.vii.1992, on burdock near chalk grassland; *Hypera adspersa* (F.), Frogmore Gravel-pit, Aston, 10.v.1989, swept; **Trachodes hispidus* (L.), Danemead, Broxbourne Woods, 4.viii.1991, on bushes; *Microplontus campestris* (Gyll.), Frogmore Gravel-pit, Aston, 29.v.1987, swept; *Platypus cylindrus* (F.), Cowheath Wood, 21.vi.1992, on oak log.

MENZIES, I. S.—Six species of British Coleoptera. *Clitostethus arcuatus* (Rossi), Bookham Common, Surrey, TQ1255, 29.ii.1992, one example by beating holly beneath oak; 14.viii.1992, one beaten from ivy growing on oak trunk; (single examples also taken by Dr R. G. Booth on 7.iii.1992 and 6.iii.1993); *Hylotrupes bajulus* (L.), Ockham Common, Surrey, TQ0858, 3.vii.1993, adult ovipositing on stump of recently felled Scots pine, *Pinus sylvestris* L., a colour print of the beetle was also shown; *Stenostola dubia* (Laich.), Burton Mill-pond, W. Sussex, SU9717, 22.v.1992, adult beaten from an alder; *Macroplea appendiculata* (Panz.), Talkin Tarn, Cumberland, NY5458, 6.vi.1992, adults on alternate-flowered water milfoil, *Myriophyllum alterniflorum* DC., colour prints of the beetle were also shown; *Altica brevicollis* Foud., Stockbridge Down, North Hampshire, SU3834, 18.vi.1993, beaten from hazel; the parasitic fly *Medina luctuosa* (Meig), which was bred from about one-third of the stock of *Altica* kept alive for ovipositing, was also exhibited, fully grown larvae emerged from the dorsal abdominal surface of the adult beetle and the flies emerged within ten days of pupation; *Platystomos albinus* (L.), Wisley Common, Surrey, TQ0659, 1.viii.1993, one example beaten from a sapling birch.

MORRIS, M. G.—Specimens of *Apion (Helianthemapion) aciculare* (Germ.) discovered by A. P. Fowles in 1992 on the coast of North Wales, (Fowles and Morris, in press, *Entomologist's Mon. Mag.*). It is a flightless species which breeds in the stems of common rockrose (*Helianthemum nummularium* (L.) Miller) and has not previously been recorded from the British Isles.

OWEN, J. A.—Some uncommon British beetles. *Agonum lugens* (Duft.), Loch Gash, Co. Clare, v.1993, in vegetation at the edge of turlough; *Colon angulare* Er., Braemar, South Aberdeen, vi.1993, swept off grass in a garden; *Thanatophilus dispar* (Herbst) and *Aclypea opaca* (L.), Dromore NNR, Co. Clare, v.1993, under stone; *Stenus glabellus* Thom. Scragh Bog, Co. Westmeath, v.1993, in wet moss; *S. kiesenwetteri* Rosen., Caragh Lough, Co. Kerry, v.1993, in sphagnum at edge of lough; *Ochthephilum fracticorne* (Payk.) and *O. jacquelini* (Boield.), Thornham, West Norfolk, iv.82, in tidal debris; *Philonthus furcifer* Renk. and *P. micans* (Grav.), Portumna, Co. Galway, v.1993, in heap of recently cut long grass on the bank of the R. Shannon; *Gabronthus thermarum* (Aubé), Epsom Downs, Surrey, viii.1993, from heap of cut grass; *Atheta (Acrotona) benicki* Allen, Berrow, North Somerset, iv.1993, from vegetation flooded by high tide; *Gyrophaena williamsi* Strand, A., Wisley, Surrey, ix.1993, in agaric fungus on the ground, ? *Russula* sp., *Selatosomus melancholicus* (F.), Belmullet, Co. North Mayo, v.1993, sandy area on coastal turf; *Atomaria rubricollis* Bris., near Tatsfield, Surrey, xii.1991, shaken out of cut foliage on chalky slope, another example was taken at the same site in i.1993; *Psylliodes luteola* (Müller, O. F.), near Wimborne, Dorset, viii.1993, several swept from the edge of a cornfield; *Crypturgus subcribosus* Eggers, Hog Wood, West Sussex, xi.1992, from bark of fallen spruce tree.

PARSONS, M. S.—13 species of Coleoptera taken in southern Britain during 1993. *Badister unipustulatus* Bon., Magor Marsh, Glam., 3.ii.1993; *Hydrochus angustatus*

Germ., Richmond Park, Surrey, 30.iv.1993, netted in flight; *Hypocaccus metallicus* (Herbst) and *Baeckmanniulus dimidiatus* (Ill.), Camber, E. Sussex, 30.v.1993; *Trox scaber* (L.), Richmond Park, Surrey, 9.vi.1993, attracted to actinic light; *Cetonia aurata* (L.), Folkestone Warren, E. Kent, 8.vii.1993; *Ctesias serra* (F.), Richmond Park, Surrey, 1.vi.1993, adult at base of old oak; *Lymexylon navale* (L.), Richmond Park, Surrey, 10.vi.1993; *Prionychus ater* (F.), Richmond Park, Surrey, bred from larvae found in red-rotten oak, adult emerged 1.vi.1993; *Mycetochara humeralis* (F.), Richmond Park, Surrey, 21.v.1993, under hawthorn log; *Phloiotrya vaudoueri* Muls., Richmond Park, Surrey, 10.vi.1993; *Prionus coriarius* (L.), Richmond Park, Surrey, 15.viii.1993, found dead under oak log; *Judolia cerambyciformis* (Schr.), Fingle Bridge, Devon, 13.vi.1993.

PLANT, C. W. & WILLIAMS, S. A.—A single example of the very rare histerid beetle *Paralister obscurus* (Kug.), formerly known as *Hister stercorarius* Hoffmann, J., collected by C. W. Plant from a pitfall trap, near Shillingford, North Devon, set between 30.iv.1993 and 5.vi.1993. The trap was set in a gently sloping bare soil site and the beetle was probably attracted by the smell of decomposing insects in the pot, which contained 424 beetles. The last recorded specimen in Britain is from Colyton, South Devon in 1947. A record for London requires confirmation.

SALMON, M.—A specimen of *Drypta dentata* (Rossi), taken in moss alongside a freshwater rill on the undercliff at Eype Mouth, Dorset, in May 1983.

WHITTON, P.—Ten species of ground beetles taken in North Somerset during the 1970s. *Blethisa multipunctata* (L.), Shapwick, ST419411, 21.iv.1976, at the edge of water on soft peat; *Elaphrus uliginosus* F., Shapwick, ST424408, 9.viii.1971, running in sunshine on bank of drainage ditch; *Amara curta* Dej. and *A. praetermissa* (Sahl.), Emborough, ST619505, 17.viii.1976, under stone in limestone quarry; *Anisodactylus binotatus* (F.), Shapwick, ST465451, 23.viii.1976, under lump of peat on dry ground; *Bradyceillus sharpi* Joy, Priddy, ST544513, 19.ii.1977, under dead vegetation; *Stenolophus skrimshiranus* Steph., Westhay Moor, ST44, 21.iv.1976, amongst vegetation at the edge of a ditch; *Licinus depressus* (Payk.), Priddy, ST545507, 11.viii.1971 and 2.ix.1976, under stones in grass near old lead mines; *L. punctatulus* (F.), Gurney Slade, ST64, 25.viii.1976, under stone in disused quarry; *Oodes helopoides* (F.), Shapwick, ST419411, 21.iv.1976, on damp peat beside water; and Westhay Moor, ST44, 23.viii.1976, in damp dried-up ditch.

HEMIPTERA

ALEXANDER, K. N. A.—Two bugs found at Porthysgo, Lleyn Peninsula, Caer., 15.vii.1993: *Enoplops scapha* (F.) (Coreidae) and *Chartoscirta cocksi* (Curt.) (Saldidae).

HAWKINS, R. D.—(1) Significant finds of 1993. *Adelphocoris seticornis* (F.) (Miridae), Llangloffan Fen, near Mathry, Pembrokeshire, 10.ix.1993, ungrazed marshy field by river, reserve of Dyfed Wildlife Trust; second record for VC45. *Miridius quadrivirgatus* (Costa) (Miridae), Milford, Surrey, 30.viii.1993, roadside bank of narrow lane, by bridge over new road; an inland record of a normally coastal bug.

(2) Nonsuch Park survey, 1993. This large urban park near Cheam, Surrey, is fringed by derelict farmland under threat of development, and has varied habitats. Recording in 1993 produced a number of local species: *Legnotus limbosus* (Geoffroy) (Cydniidae), 29.viii.1993; *Stygnocoris rusticus* (Fallén) (Lygaeidae), 29.viii.1993; *Deraeocoris olivaceus* (F.) (Miridae), 13.vi.1993, beaten from hawthorn; *Orthocephalus coriaceus* (F.), 4.vii.1993; *Orthocephalus saltator* (Hahn) (Miridae), 23.viii.1993.

HODGE, P. J.—Seven species of Heteroptera found in Sussex during 1992 and 1993. *Nysius senecionis* (Schilling) (Lygaeidae), Holman Wood, near Brede, E. Sussex, TQ7920, 20.ix.1992, one male and one female swept in a heathy woodland clearing; the first British record. *Hallobatus rufescens* (Burmeister) (Miridae), The Coombe, Lewes, E. Sussex, TQ4210, 9.iv.1993, one macropterous male swept off very short downland turf. *Strongylocoris leucocephalus* (L.) (Miridae), Cissbury Ring, W. Sussex, TQ1307, 3.vi.1993, two swept off very short downland turf. *Globiceps juniperi* Reuter (Miridae), St Leonard's Forest, W. Sussex, TQ2130, 31.vii.1993, one female swept from *Molinia* in a heathy woodland ride. *Microvelia pygmaea* (Duf.) (Veliidae), Heath Patch, near Storrington, W. Sussex, SU7822, 1.viii.1993, one example in pond in large sand pit. *Sigara semistriata* (Fieb.) (Corixidae), North Park Wood, near Storrington, W. Sussex, TQ0515, 27.vi.1993, in acidic pond.

JONES, R. A.—Three species of rhododendron-feeding bug from Dulwich Park, London SE21 (VC 17, 'Surrey'). *Kleidocerys resedae* (Panz.) (Lygaeidae), 9.ix.1993; *Stepanitis rhododendri* Horvath (Tingidae), 23.vii and 9.ix.1993, and *Placotettix taeniatus* (Kirschbaum) (Cicadellidae), 9.ix.1993.

KIRBY, P.—A selection of interesting Hemiptera taken in 1991 and 1992. *Aradus betulae* (L.) (Aradidae), Strathfarrar, VC96, 22.vii.1992. *Eurydema oleraceum* (L.) (Pentatomidae), Kennack Sands and Cadgwith, W. Cornwall, ix.1992. *Dicranoccephalus agilis* (Scop.) (Stenocephalidae), Loe Bar, W. Cornwall, 4.ix.1992. *Dicranoccephalus medius* (Muls. & Rey) (Stenocephalidae), Folkestone Warren, E. Kent, 21.v.1991. *Orsillus depressus* (Dallas) (Lygaeidae), Gidea Park, S. Essex, 27.ix.1992, new to Essex. *Megalonotus antennatus* (Schilling) (Lygaeidae), Dogsthorpe Star Brickpit, VC32, v.1992. *Megalonotus dilatatus* (H.-S.) (Lygaeidae), Dungeness, E. Kent, 23.v.1991. *Megalonotus sabulicola* (Thom.) (Lygaeidae), Oxney Road, Peterborough, 7.vii.1992; Bainton Pits, Northants., 9.viii.1992; new to VC32. *Eremocoris podagrarius* (F.) (Lygaeidae), Dogsthorpe Star Brickpit, VC32, 24.vii.1992. *Eremocoris plebejus* (Fall.) (Lygaeidae), Strathfarrar, VC96, 22.vii.1993; Tomfat Wood, VC96, 24.vii.1992. *Aphanus rolandri* (L.) (Lygaeidae), Dungeness, E. Kent, 31.v.1991. *Tropistethus holosericeus* (Scholtz) (Lygaeidae), Dungeness, E. Kent, 3.v.1991. *Himacerus apterus* (F.) (Nabidae), macropterous female, Ouse Washes, Welches Dam, Cambs., 4.viii.1992. *Acalypta nigrina* (Fall.) (Tingidae), Tomfat Wood, VC96, 24.vii.1992. *Lasiacantha capucina* Germ. (Tingidae), Predannack, W. Cornwall, 20.ix.1992. *Chlamydatus pulicarius* (Fall.) (Miridae), Strathfarrar, VC96, 22.vii.1992. *Orthotylus rubidus* (Fieb.) (Miridae), Brancaster, E. Norfolk, 7.ix.1991. *Globiceps cruciatus* Reuter (Miridae), Pembrey Forest, Carm., 9.viii.1991. *Lygus punctatus* (Zett.) (Miridae), Fasnayle, VC96, 20.vii.1992. *Capsus wagneri* Remane (Miridae), Frays Farm, Middx, 26.vii.1991; Langholm, Dumf., 24.vi.1992; Kielder Water, Northumb., 16.vi.1992; all appear to be new county records. *Teratocoris caricus* Kirkaldy (Miridae), Kielder Water, Northumb., 15.vi.1992, new to Northumberland. *Saldula arenicola* (Scholtz) (Saldidae), Dungeness, E. Kent, 21.v.1991. *Saldula opacula* (Zett.) (Saldidae), Cliffe Marshes, W. Kent, 27.vii.1991; Ouse Washes, Cambs., 5.viii.1992. *Hebrus pusillus* (Fall.) (Hebridae), Higham Marshes, W. Kent, 28.vii.1991. *Microvelia pygmaea* (Duf.) (Veliidae), Dartford Marshes, W. Kent, 1.ix.1991. *Agallia brachyptera* (Boh.) (Cicadellidae), Bainton Pits, Northants., 31.vii.1992. *Doratura impudica* Horvath (Cicadellidae), Brancaster, W. Norfolk, 7.ix.1991. *Sagatus punctifrons* (Fall.) (Cicadellidae), Ouse Washes, Cambs., 3.viii.1992, new to Cambridgeshire and the third British record. *Macrosteles frontalis* (Scott) (Cicadellidae), Maxey South Pits, Northants., 9.viii.1992. *Macrosteles quadripunctulatus* (Kirschbaum) (Cicadellidae), Thornhaugh Quarry, Northants., 10.viii.1992; Snettisham, W. Norfolk, 7.ix.1991. *Macrosteles fiebери* (Edw.)

(Cicadellidae), Tomfat Wood, VC96, 24.vii.1992. *Oliarus leporinus* (L.) (Cixiidae), Machynys, Carm., 10.viii.1991. *Trigonocranus emmeae* Fieb. (Cixiidae), Brookfield Plantation, Northants., 23.vii.1991, new to Northamptonshire. *Ribautodelphax pungens* (Ribaut) (Delphacidae), Folkestone Warren, E. Kent, 21.v.1992. *Dicranotropis divergens* Kirschbaum (Delphacidae), Strathfarrar, VC96, 22.vii.1992.

MENZIES, I.—Heteroptera from Surrey. *Aelia acuminata* (L.) (Pentatomidae), examples swept or found in grassy areas on Bookham Common, 27.viii.1990; Downside, Leatherhead, 22.ix.1991, and Epsom Common, 29.viii.1993. *Eurydema oleraceum* (L.) (Pentatomidae), Bookham Common, 23.v.1992, and Ashtead Common, 15.vi.1992: observed often in large numbers on both these commons in recent years; though forms with yellow or red markings were most frequent, examples with white markings were also seen. Favoured foodplants were yellow rocket and white garlic mustard. *Sehirus luctuosus* Muls. & Rey (Cydnidae), White Hill, Mickleham, Surrey, 3.v.1992, found in numbers on the ground under plants of forget-me-not on the south of the hill. *Thyreocoris scarabaeoides* (L.) (Cydnidae), White Hill, Mickleham, Surrey, 3.v.1992, found crawling over low plants in a woodland clearing on the south of the hill in company with *S. luctuosus*. *Sciocoris cursitans* (F.) (Scutelleridae), Howell Hill Nature Reserve, Cheam, Surrey, 14.iv.1991, large numbers found congregating gregariously in moss growing amongst grass in a chalky field. *Cimex lectularius* L. (Cimicidae), St Bartholomew's Hospital, vi.1993, found on an outpatient's sleeve. *Oeciacus hirundinis* (Jenyns) (Cimicidae), Wallington, Surrey, x.1993, found by Dr Roger Booth on a windowsill beneath a house martin's nest. *Gonocerus acuteangulatus* (Goeze) (Coreidae): previously found only in the immediate vicinity of Box Hill, usually in small numbers on box, this bug has been found in recent years on both Bookham and Epsom Commons, where box is unknown. Bookham Common; one adult beaten from holly, Hill House Wood, 14.i.1990; examples beaten from oak (one adult), yew (one adult) and hawthorn (two adults, one nymph), Bayfield and Eastern Plain, 27.viii.1990; three nymphs and three adults beaten from hawthorn, Bayfield Plain, 1.ix.1990; two adults beaten from holly beneath mature oaks, Hill House Wood, 6.iv.1991; one adult beaten from aspen, Bayfield Plain, 22.ix.1991; three nymphs, reared to check identity, beaten from hawthorn near Merrit's Cottage. Epsom Common: three adults found in the vicinity of the Wells, two beaten from wild rose and one from hawthorn, 29.viii.1993. Colour prints of adults and nymphs of *G. acuteangulatus* were exhibited.

HYMENOPTERA

ARCHER, M. E.—A black and white photograph of the early stage in the construction of a social wasp nest by a queen *Dolichovespula media* (Retz.). The aerial nest was about twice the height of a standard match box and was unusual in having two tube-like entrances on its base.

CHANDLER, P. J.—A single male of the chalcid *Spilochalcis xanthostigma* Dalm. collected by sweeping low vegetation in a woodland ride in the woodland fringe bordering the pingo pool area at Foulden Common, Norf., during the Society's field meeting on 8.viii.1992. The only recent previous British record was from Tilford, Surrey, in July 1965 (Fisher, J. P., 1965, *Entomologist's Mon. Mag.* 101: 115), with one definite earlier record being known, from Kings Lynn, Norf., vii.1913. According to Ferrière & Kerrich (1958, *Handbk Ident. Br Insects* 8(2a): 14), it is a parasite of sawfly larvae of the genus *Arge*. The only other British Chalcidinae are three species of the genus *Chalcis*, which parasitize larvae of soldier flies of the genus *Stratiomys*. One

of these, *Chalcis sispes* (L.) collected at Cothill Fen, Berks, on 1.vii.1976, was shown for comparison.

EDMUND, H. A.—An unidentified vespid wasp taken at hotel lights on Cyprus on 14.x.1993.

ELSE, G. R. & ROBERTS, S. P. M.—Twenty-two species of aculeate wasps and bees collected on Salisbury Plain, Wilts., in 1991–93. These included the solitary bees *Andrena simillima* (F.), *A. marginata* F. and *Nomada argentata* H.-S., all recorded during July 1993 at Figheldean Down as new to Wiltshire. Further details of the aculeates recorded during this survey will appear in an article to be published shortly in this journal.

GODFREY, A.—A specimen of *Chalcis sispes* (L.) (Chalcidae) taken at Neatscout Marshes, Isle of Sheppey, Kent, on 25.vi.1993. This species parasitizes larvae of *Stratiomys* spp. (Diptera: Stratiomyidae).

HALSTEAD, A. J.—Some local sawflies and aculeate wasps taken during 1993. Cimbicidae: male *Abia candens* Konow collected by M. Howe, 10.vii, at Kenninghall Fen SSSI, Norf. This is the less common of the two British *Abia* spp. and males of *A. candens* are extremely scarce. Tenthredinidae: female *Dolerus taeniatus* Zaddach, swept near a brackish stream, 27.iv, at the north end of Kenfig Burrows, near Port Talbot, Glam.; male & female *Empria candidata* (Fall.), swept from birch, 15.iv, Wisley Common, Surrey; *Allantus truncatus* (Klug), male 7.viii, The Sheepleas, near West Horsley, female 26.vi, White Downs, near Westcott, both swept from chalk grassland in Surrey; female *Pareophora pruni* (L.), on blackthorn flower, 30.iv, river bank at RHS Garden, Wisley, Surrey; *Parna tenella* (Klug), male 4.v and female 29.v, both swept from *Tilia cordata* Miller at Therfield Heath, Royston, Herts; female *Pristiphora quercus* (Hartig) and female *Nematinus acuminatus* (Thom.), both swept from birch scrub, 20.vi, Chobham Common, Surrey; female *Amauronematus crispus* Benson and female *A. mundus* Konow, both swept from *Salix repens* L., 17.iv, Horsell Birch, near Woking, Surrey; *A. histrio* (Lep.) male on *Salix* catkin, 4.iv, Horsell Common, Surrey; female swept 18.iv, Middle Marsh, Dinton Pastures, near Winnersh,

Plate II. ANNUAL EXHIBITION 1993

1	2	3	4
6	7	5	
8	9	10	
	11		
12	13		
14	15	16	

- 1: *Lomasplilis marginata*, Horton, Northants, vi.1990, P. Sharpe.
- 2: *Ligdia adustata* ab. *plumbea*, Brockenhurst, Hants, 29.v.1987, B. K. West.
- 3: *Pardasena virgulana*, Thorpe-le-Soken, Essex, 27.ix.1992, M. J. Sterling.
- 4: *Athetis hospes*, St Agnes, Isles of Scilly, 14.ix.1993, J. Hale.
- 5: *A. hospes*, Lizard, Cornwall, 26/27.viii.1978, J. Porter.
- 6: *Schoenobius gigantella*, Stoke Saltings, Kent, 30.vii.1993, R. F. McCormick.
- 7: *Scopula marginipunctata*, Ryde, Isle of Wight, 22.v.1993, D. Peach.
- 8: *Chrysodeixis chalcites*, Dungeness, Kent, 19.viii.1993, S. Clancy.
- 9: *Euproctis similis*, Tilshead, Wilts., 29.vii.1993, S. Clancy.
- 10: *Hadena perplexa*, Dungeness, Kent, 30.iv.1993, S. Clancy.
- 11: *Sphinx ligustri* ab. *albescens*, Brockenhurst, Hants., 28.vi.1993, A. Russwurm and H. Middleton.
- 12: *Odontognophos dumetata hibernica*, Co. Clare, viii.1991, P. Forder.
- 13: *Agrotis exclamationis*, bilateral gynandromorph, Muston, S. E. Yorks., 30.vi.1993, P. Q. Winter.
- 14: *Agriphila geniculea*, Kennack Sands, Cornwall, 26.viii, 1993, R. J. Heckford.
- 15: *Pseudopanthera macularia*, Virginia Water, Surrey, 12.v.1993, P. Baker.
- 16: *Scoparia ambigualis*, Hamstreet, Kent, 19.vi.1993, B. Skinner.

Photo: D. E. Wilson

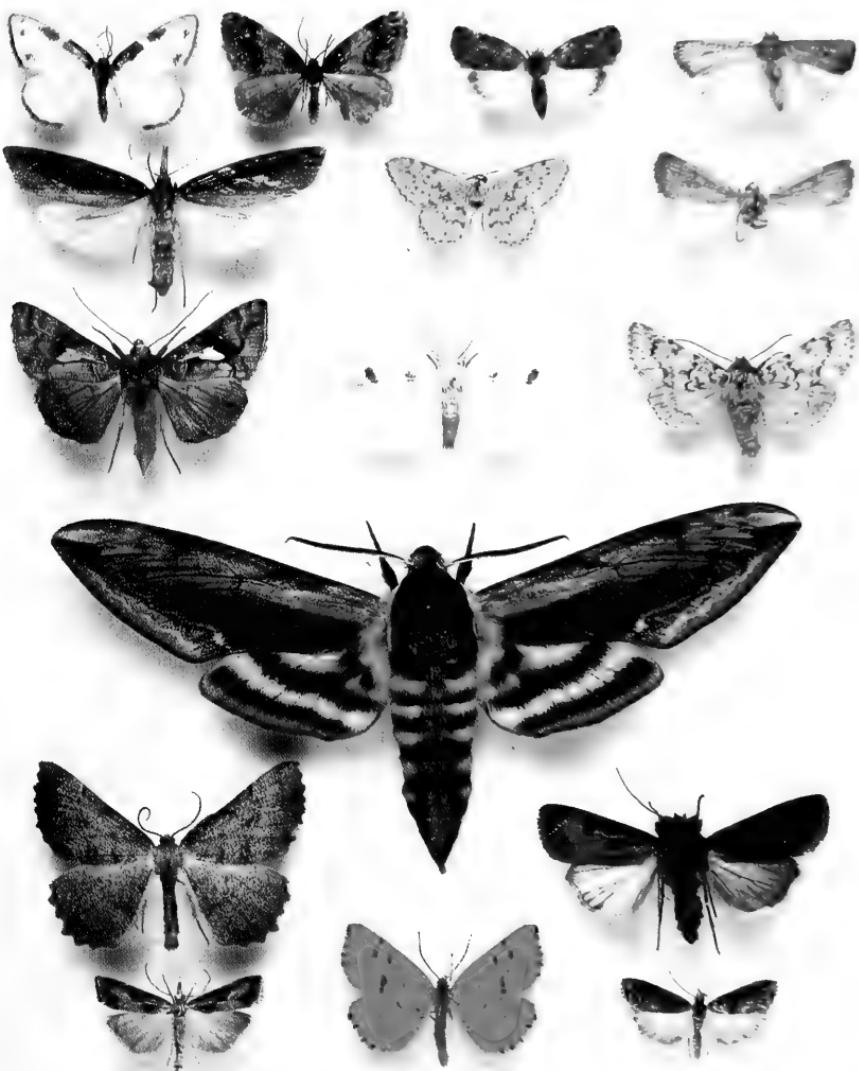


Plate II. ANNUAL EXHIBITION 1993

Berks. Sapygidae: male *Sapyga quinquepunctata* (F.), on sandy ground, 24.iv, Horton, Gower Peninsula, Glam. Sphecidae: female *Philanthus triangulum* F., at its nest site in a sandy bank, 8.viii, Horsell Common, near Woking, Surrey. This is believed to be the first Surrey record this century for this species. It preys on honeybees and has become more widely distributed in southern and eastern England during the last 10 years.

HODGE, P. J.—A specimen of the local pompilid wasp *Aporus unicolor* Spin. taken 15.viii.1993 at Ambersham Common, W. Sussex, SU9119. This species develops as a parasitoid of the purse-web spider, *Atypus affinis* Eichwald, which it locates and paralyses within the spider's characteristic silken burrow.

MILES, S. R.—Some scarce aculeate Hymenoptera taken in southern England in recent years. Chrysididae: *Chrysis fulgida* L., 25.vi.1988, Aldershot, Hants. When taken in 1988 this was the first UK record for 40 years. It was captured beside nest holes of other aculeates, some of which were being visited by sphecid wasps of the genus *Trypoxylon*, in a young but rotten oak tree on the edge of heathland. Sphecidae: *Crossocerus binotatus* Lep. & Brulle, 9.viii.1991, taken in the eastern, and probably less well recorded, part of Windsor Great Park, Berks. Halictidae: *Halictus confusus* Smith, 10.vii.1991, north west of Aldershot, Hants; *Lasioglossum xanthopum* (Kirby), 6.vi.1991, taken on *Brassica* flowers growing on an old rubbish dump about 1 mile inland at St Merryn, Cornwall. Anthophoridae: *Nomada argentata* H.-S., 9.viii.1986, on field scabious flowers at Croxton Heath, Norfolk. This species is a nest parasite of the bee *Andrena marginata* F, which is frequent at this site. Megachilidae: *Stelis punctulatissima* (Kirby), 4.viii.1990, swept from the herbage along the former railway line in a military training area at Longmoor, near Liss, Hants. This species is a nest parasite of the solitary bee *Anthidium manicatum* (L.).

ORAM, R.—Some aculeate Hymenoptera collected in a Leatherhead, Surrey, garden during 1993. In addition to some unidentified material these were Vespidae: *Vespula germanica* (F.), *V. vulgaris* (L.); Sphecidae: *Ectemnius continuus* (F.), *Cerceris rybyensis* (L.); Andrenidae: *Andrena fulva* (Müller), female and larvae, *A. scotica* Perkins, *A. pubescens* Ol.; Halictidae: *Halictus rubicundus* (Christ); Megachilidae: *Osmia rufa* (L.); Anthophoridae: *Nomada flava* Panz., *N. marshamella* (Kirby).

PLANT, C. W.—A specimen of *Nomada xanthosticta* (Kirby) (Anthophoridae) collected by the exhibitor (det. P. Harvey) 17.iv.1987 at Brandon, Suffolk. This rare bee is a cleptoparasite of the mining bee *Andrena praecox* (Scop.), a relatively widespread species associated with sallow, *Salix* spp. on which it is dependent for pollen. The only other recent records for *N. xanthosticta* are Dungeness, Kent 1988; Swindon, Wilts., 1989 and Burbage, Wilts., 1990. Prior to this it was found in Oxfordshire in 1949. The only previous Suffolk record was a single sighting in the previous century. The only record for the adjacent county of Norfolk was also in the last century.

UFFEN, R. W. J.—Some aculeate bees and wasps collected in Hertfordshire 1992–93. Probable first county records collected from sand bunkers on golf courses: male *Andrena barbilabris* (Kirby), 24.v.1993, male *Sphecodes pellucidus* Smith 27.vii.1992 at Therfield Heath, Royston; female *A. barbilabris* (Kirby), worker *Lasioglossum malachura* (Kirby) and female *S. pellucidus* Smith, all 5.vii.1993 at Watford; *L. malachura* (Kirby) was also taken at Letchworth, 28.viii.1993, while a sphecid wasp, female *Cerceris arenaria* (L.) was taken 4.vii.1993 at Watford. Probable first county records from other artificial sandy sites are *Anoplus concinnus* (Dahl.) (Pompilidae), both sexes from a deep sand pit beneath boulder clay, 21–28.viii.1993, Holwell, Hitchin; male *Crossocerus wesmaeli* (V. d. Lind) (Sphecidae), 5.viii.1993, from a quarry spoil bank of pure sand at Parkbury, St Albans. Probable first county

records from gravel heaths are *Andrena fuscipes* (Kirby), both sexes Nomansland Common, Wheathampstead, 18.viii.1992 and Berkhamsted Common golf course (no sand bunkers there), 17.viii.1993. Also shown were examples of the social wasp *Dolichovespula media* (Retz.), male 20.viii.1993, Watton-at-Stone, light and dark workers 15.vii.1993, Welwyn, queen 16.ix.1992 sitting on an empty nest, Nomansland; a male *Anthidium manicatum* (L.) (Megachilidae) taken 15.viii.1993 by Enid Evans in her Berkhamsted garden, apparently the only record in Herts. since 1933.

WALKER, D. H.—A series of a chafer wasp, *Campsomeriella thoracica* F. (Scoliidae), collected in Saudi Arabia, showing both males and females. The latter are about twice the size of the males and differ markedly in appearance. The sexes also differ in their habits; the males frequent flowers while the females patrol areas of short turf. The females somehow locate chafer beetle larvae under the turf and then lay a single egg on the grub. The wasp larva feeds as an ectoparasite on the chafer grub.

ORTHOPTERA

CRONIN, A. R.—Three unidentified grasshoppers collected February 1993 in San Pablo in the Phillipines.

MENZIES, I.—Some recently observed sites for the cone-head crickets in north-east Surrey. The short-winged cone-head, *Conocephalus dorsalis* (Lat.): 12.viii.1992 colonies found at three separate sites on Bookham Common; 19.viii.1993 a large colony seen in a relatively dry grassy area on Epsom Common; 22.vii.1990 a small colony observed in a grassy area with *Juncus* and bracken alongside Penn Pond, Richmond Park. The long-winged cone-head, *Conocephalus discolor* (Thunb.): 12.viii.1990 a male observed in grass near Merrit's Cottage, Bookham Common, also a colony has been found on the Western Plain and noted to be thriving in the summer of 1993; 22.ix.1991 a colony at Downside, south of Leatherhead; 21.viii.1993 a small colony in a grassy clearing of Caen Wood, Ashtead Common; 30.viii.1993, a single adult male found amongst grass at Howell Hill Nature Reserve, Cheam; 26.viii.1993 a single adult male in a grassy area of Warren Farm field, Nonsuch Park, Cheam.

NEUROPTERA

HALSTEAD, A. J.—A single specimen of the widespread but scarce lacewing *Drepanopteryx phalaenoides* (L.) (Hemerobiidae). This was swept at the margin of deciduous woodland and chalk meadow at The Sheeples, near West Horsley, Surrey, on 7.viii.1993.

REPTILIA

WALKER, D. H.—A desiccated specimen of a hatchling hawk-billed turtle, *Eremochelys imbricata*, found dead in sand dunes at Rastanura, Saudi Arabia, in 1986.

ILLUSTRATIONS

CLARKE, J.—A series of photographs of an attempt to breed *Bembecia chrysidiiformis* (Esp.), including adults, eggs, larvae and pupae. Moths were artificially fed on sugar solution each morning then placed in a cage containing a mature great water dock and the cage placed in direct sunshine. The female began calling as soon

as the sun came out, the male responded to this by frantic waving of antennae and approaches to the female. It took two days before a pairing occurred and they only remained *in copula* for between one and two hours. The female began laying mostly on the dorsum of the leaves, close to the midrib, some were also laid on the stem of the inflorescence. Only two larvae were observed to hatch although many of the other ova had clearly hatched, probably unobserved overnight. These two crawled down to the base of the plant and vanished, hopefully into the rootstock. There is at present no evidence of the presence of the larvae in the now overwintering rootstock of the dock. Only time will determine the success of this project.

COOPER, K.—A selection of colour prints, mainly 12" × 16". The following three prints were from Kodachrome slides taken in Lanzarote. *Diachrysia orichalcea* (F.), the slender burnished brass, *Hyles lineata* (F.), the striped hawk-moth and *Colias croceus* (Geoff.). The remainder were taken at Abbeywood House, Nottinghamshire. *Hypsopygia costalis* (F.), *Dioryctria mutatella* (Fuchs), *Orthopygia glaucinalis* (L.), *Lozotaeniodes formosanus* (Gey.), *Pandemis corylana* (F.), *Crambus lathonellus* (Zinck), *Agriphila tristella* (D. & S.), *Agriphila inquinatella* (D. & S.), *Rhyacionia pinicolana* (Doubl.), *Catoptria pinella* (L.), *Udea ferrugalis* (Hüb.), and *Platyptilia gonodactyla* (D. & S.).

JONES, R. A.—Various photographs and accompanying text. An aberration of the comma butterfly, *Polygonia c-album* (L.), in which the white comma mark was developed into the shape of a 'p'. The pupa of the tortoise beetle *Cassida viridis* L., allegedly showing its resemblance to a lace-wing. Ants, *Lasius niger* (L.), apparently feeding directly on plant sap oozing from the damaged leaves of the garden plant *Ligularia dentata* (Gray) Hara. The ribwort plantain *Plantago lanceolata* L. which had somehow been induced to form bilobed inflorescences. A congregation of unidentified creatures which might be insect larvae, resembling flattened millipedes, found under a rotten log in Guatemala, Central America.

LEWINGTON, R.—Original paintings from forthcoming books on Lepidoptera; *The moths and butterflies of Great Britain and Ireland* (MBGBI) Vol. 3 plate 2—*Yponomeutinae*, Harley Books, 1994; MBGBI Vol. 3—larval cases of *Coleophoridae*, *C. lixella* Zell., *C. albidella* (D. & S.), *C. bernoulliella* Goeze, *C. currucipennella* Zell. and *C. ibipennella* Zell.; *The butterflies of the West Indies and South Florida*, Plate 7—*Nymphalidae*, OUP, 1994; *A field guide to the butterflies of Britain and Europe*, plate 16—*Pieridae*, *Colias libanotica*, *C. balcanica* and *C. myrmidone*, Collins 1995.

MORRIS, R.—Two boards presenting details of progress on the Surrey Hoverfly Scheme, including tetrad maps of *Cheilosia nigripes* (Meig.), *C. soror* (Zett.), and *Episyphus balteatus* (Deg.).

PORTER, J., SKINNER, B., COLLINS, G. & CHURCH, S. H.—The provisional text pages and type of plates to be used in the hopefully forthcoming publication of an illustrated guide to the caterpillars of the British Isles, supported by photographs of over 840 different larvae that will be used in the book. A series of views of the triangle moth, *Heterogena asella* (D. & S.) larva, with notes on its life-cycle.

REVELS, R.—A selection of photographs of British butterflies and other wild life from the extensive library of this well known wild life photographer.

UFFEN, R. W. J.—Photographs of *Metriotes lutarea* (Haw.) on a flower of its foodplant, *Stellaria holostea* L. and of larvae with their cases consisting of empty seedheads, from Belhus Wood, Aveley, Essex. Cases appeared 10/15.vi.1993.

WALKER, D. H.—Entitled "The fight for survival", a photograph of the breeding ground in Saudi Arabia of the hawk-billed turtle, *Eretmochelys imbricata*. Another photograph showed an oil refinery. The female turtle lays up to 500 eggs in the sand

dunes. The large number permits a few young turtles to successfully run the gauntlet of predators and adverse weather conditions to reach the sea. Man's love of the motorcar has added yet another burden by loss of habitat. The National Commission for Wildlife Conservation and Development have taken active steps to help wildlife in the kingdom.

SHORT COMMUNICATION

Pandivirilia (Psilocephala) melaleuca (Loew) (Diptera: Therevidae) new to Gloucestershire.—A therevid larva was found while searching through cuboidal red-rotten heartwood in a fallen oak trunk in Hailey Wood, Cirencester Park, Glos., (SO962003), on 26.iii.1993. The only therevid known to breed in this situation in Britain is *Pandivirilia melaleuca*. The red-rot was extensively galleried but little else was found other than a few beetles—*Cis pygmaeus* (Marsh.) and *Mycetophagus piceus* (F.), species which are well-known to breed in this situation. The fungal agency is likely to have been *Laetiporus sulphureus* (Bull. ex Fr.).

This fly has mainly been recorded from the Windsor Forest area, but Allen (1981) has reported finding a larva in Greenwich Park in March 1980, also in red-rot in an old oak. At Windsor, it mainly breeds in red-rotten oak, but has occasionally been found in rotten beech and once in ash (Owen, 1993).

In addition to my own, I am aware of a number of other recent records of therevid larvae from rotten heartwood: Richmond Park, Surrey, in very dry powdery rotten oak exposed after the 1987 gale (Owen, 1993); one in a fallen oak in Bushy Park, Middlesex, J. A. Owen and P. J. Hodge (in Owen, 1993); one in a moribund pollard ash at a Worcestershire locality, 11.iii.1989 (P. F. Whitehead, pers. comm.), and A. P. Fowles (pers. comm.) has found what also appears to be a therevid larva within red-rot in an oak at a locality in Cardiganshire. It begins to seem that this rare relict old forest species actually occurs across a large area of southern Britain. The recent spate of records perhaps reflects an increased interest in Diptera by coleopterists—the larval habitat is one more likely to be investigated for beetles than for flies!

I would like to record my thanks to Alan Stubbs for his comments on my larva, to Martin Drake for information from the Larger Brachycera Recording Scheme, and to Paul Whitehead and Adrian Fowles for permission to mention their records.—K. N. A. Alexander, 14 Partridge Way, Cirencester, Gloucestershire GL7 1BQ.

REFERENCES

Allen, A. A. 1981. *Psilocephala melaleuca* (Loew) (Dipt., Therevidae) apparently surviving in S.E. London. *Entomologist's Mon. Mag.* **117**: 256.
Owen, J. A. 1993. Rearing *Psilocephala melaleuca* (Loew) (Diptera: Therevidae) from larvae. *Entomologist's Rec. J. Var.* **105**: 257–259.

HAWK-MOTHS IN HONG KONG, APRIL 1993, WITH ECOLOGICAL NOTES

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Yuen Long, New Territories, Hong Kong*

Hong Kong and the New Territories have been much in the news recently because they are due to revert to Chinese rule in 1997 and preparations for this are now underway. The city skyscrapers in Hong Kong are famous. The large tracts of native vegetation, though mostly secondary and greatly affected by man, hold much of interest entomologically, but the existence of these areas is so little known outside the country that it comes as a surprise to many that they exist at all. Some areas have been set aside for nature conservation and it is to be hoped that these will not be adversely affected by the change in administration. During annual leave in Hong Kong in April 1993, we were able to visit some of these areas and see the wildlife they support, including the moths. From 5 to 18 April 1993, we were able to operate a Robinson pattern 125-W mercury vapour light trap on a total of ten nights at five sites within Hong Kong Island and the New Territories. We recorded a great many species of moths and representative specimens were collected, most of which will need to be set and even dissected before they can be identified. Anticipating that this will take some time, this paper concentrates on the hawk-moths (*Sphingidae*) that we encountered.

The hawk-moths of Hong Kong were reviewed recently by Tennent (1992) who light-trapped in Hong Kong over a period of 18 months from June 1989 to November 1990, recording 63 species. We are able to contribute the following additional records. In addition to light-trapping, we made brief searches for eggs and larvae. A total of 16 species of hawk-moths was recorded during our visit and one new species is added to the list published by Tennent. Hawk-moths were recorded from sites additional to those covered by Tennent, including the mangrove swamps at Mai Po and coastal scrub-land at Long Harbour in the New Territories. During our visit we met up with Mr Kent Li who joined us for visits to Mai Po and the woodland at Tai Po Kau. Kent has a mercury vapour light but no light trap. Since 1986 he has paid a number of visits to outdoor lights in various locations in the New Territories and has found and reared the early stages of a number of species. Drawing on this experience he has kindly provided background material on the species we encountered and this is included here.

REPULSE BAY, HONG KONG ISLAND

Our initial base on arrival in Hong Kong was a thirteenth-storey apartment in a tower block overlooking Repulse Bay and backing on to a hill-side covered in native scrub. The hill-side rose above the tower block and the vegetation was within 100 m horizontally from the balcony of our apartment. The Robinson light trap was operated on the balcony all night on the nights of 8 and 9 April. A number of different moth species were seen amongst the scrub during day-time walks but only four moths reached the light trap. These included a noctuid and a pyralid on 8 April and a geometrid and a pyralid on 9 April. No hawk-moths were seen and no moths at all on 7 April which was cool, wet and windy.

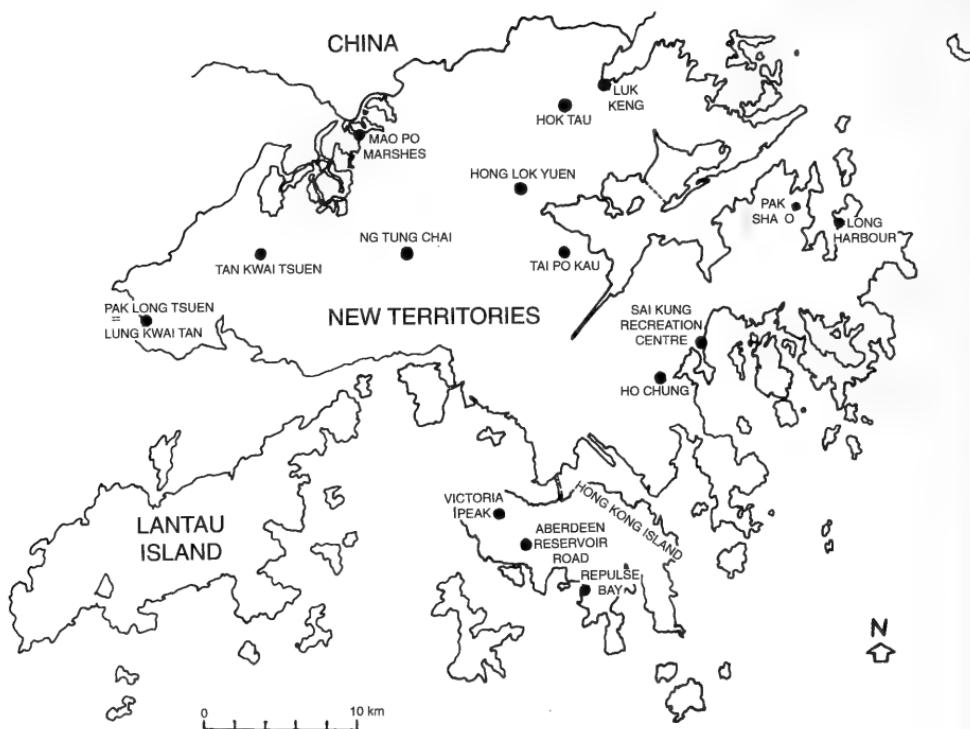


Fig. 1. Map of Hong Kong and the New Territories.

TAI PO KAU SPECIAL AREA, NEW TERRITORIES

On the nights of 10 and 18 April the light trap was operated from dusk onwards in the woodland at Tai Po Kau (Fig. 2). This is widely considered the most well-developed and species-rich woodland in Hong Kong in terms of native trees and shrubs (Thrower, 1984) and is designated a Special Conservation Area by the Government of Hong Kong. Even this woodland is not primary forest however. The woodland has a long history of management and large areas of the original tropical broad-leaved woodland, dominated by oaks and laurels, were cleared and planted with crops of South China pine, *Pinus massoniana* Lam., *Eucalyptus* and other introduced species in the 1940s and 1950s. The conifers have largely failed and native broad-leaved trees have grown up in their shelter in the meantime, some reaching in excess of 10 m in height. On both visits the light trap was operated in an area cleared as a picnic site among the trees, about 100 m from the guard post at the entrance to the reserve. The weather was mild and calm on both nights and moths began to arrive as soon as darkness fell—about 19.15 hrs. There was greatest moth activity between dusk and 21.00 hrs after which there was a noticeable decrease in the rate at which new individuals arrived at the trap. On the first night we packed up at 22.00 hrs, by which time activity had dropped to a low ebb. On the second night we continued until 22.30 hrs, at which time few moths were arriving, although new species were still being added. A total of 33 individuals of five species of hawk-moths were recorded at the trap. The numbers of each species are shown in the accompanying Table.



Fig. 2. Light trap in woodlands at Tai Po Kau, New Territories.

MIKE BASCOMBE'S GARDEN, HONG LOK YUEN, NEW TERRITORIES

The light trap was only operated here on the night of 10 April. We set the trap up at 22.15 hrs after returning from our first trapping session at nearby Tai Po Kau. The trap was operated till dawn and in the morning contained about 30 moths, mostly pyralids, but including two hawk-moths. The garden was one of a large number on a compound laid out much like a western housing estate. The gardens contain a mixture of grass lawns, herbaceous plants, shrubs and trees of a range of native and introduced species. The gardens were predominantly open and heavily managed. Mike's garden contained a large specimen of the white orchid tree *Michelia alba* de Candolle which probably originates from Malaysia but is now widely cultivated in private gardens in Hong Kong.

WARDHAVEN BUNGALOW, EAST ARM, LONG HARBOUR, SAI KUNG COUNTRY PARK, NEW TERRITORIES

From 13 April to the morning of 16 April we stayed at Wardhaven, a private bay with a single bungalow and boat house on the coast, at the foot of a hillside largely denuded of trees and shrubs but with a selection of both in the compound around the bungalow. The light trap was operated all night on each of the three nights.

MAI PO MARSHES WWF NATURE RESERVE, NEW TERRITORIES

The light trap was operated on this nature reserve from before dusk until dawn on the night of 16 April and from 20.45 hrs (2 hours after dusk) until dawn on 17 April. Mai Po is a nature reserve of the World Wide Fund for Nature (WWF Hong Kong) and is internationally important as a feeding ground for migrant birds on

passage between Siberia and Australasia. It consists of coastal mangrove swamp and a system of man-made shrimp ponds or 'geiwais' and fishponds that have been managed for several decades but are now largely abandoned (Irving & Morton, 1988). It is the most extensive area of wetland in Hong Kong and the only substantial area of mangroves remaining. The light trap was operated on a 50 m cable from outbuildings at the education centre adjacent both to reed beds of *Phragmites australis* (Cav.) Steudel and a large block of mangrove trees, principally *Kandelia candel* (L.) Druce.

RESULTS

The species, numbers of individuals recorded and their sites and dates are given in the accompanying Table.

Table of results.

Date: Site	April RB	7-9 TPK	10 HLY	13 LH	14 LH	15 LH	16 MP	17 MP	18 TPK
<i>Cechenena aegrota</i>	—	12	1	—	—	—	—	—	15
<i>Acosmeryx shervillii</i>	—	1	—	—	—	—	—	—	2
<i>Marumba dyras</i>	—	—	1	1	3	4	—	—	—
<i>Theretra suffusa</i>	—	—	—	1	—	—	—	—	—
<i>Hippotion rosetta</i>	—	—	—	1	—	—	—	—	—
<i>Leucophaebia lineata</i>	—	—	—	1	—	—	—	—	—
<i>Theretra pallicosta</i>	—	—	—	—	1	—	—	—	—
<i>Macroglossum fritzei</i>	—	—	—	—	1	—	—	—	1
<i>Clanis bilineata</i>	—	—	—	—	—	1	—	—	—
<i>Agrius convolvuli</i>	—	—	—	—	—	—	—	1	—
<i>Theretra clotho</i>	—	—	—	—	—	—	—	1	—
<i>Theretra latreillii</i>	—	—	—	—	—	—	—	—	1
<i>Pergesa acteus</i>	—	—	—	—	—	—	—	—	1
<i>Eupanacra mydon</i> (larva)	—	—	—	—	—	—	—	—	1
<i>Sataspes infernalis</i> (ova)	—	—	—	—	—	—	—	—	12+
<i>Macroglossum corythus luteata</i> —one at light on Victoria Peak 23 April (A. Galsworthy)									

Site codes: RB = Repulse Bay; TPK = Tai Po Kau; HLY = Hong Lok Yuen; LH = Long Harbour; MP = Mai Po.

OBSERVATIONS

The moths were all in generally good condition and appeared to be freshly emerged. Early April in Hong Kong is usually the beginning of the early summer rains. January and February are normally dry, rainfall is light in March but increases through the months from April to October, in any of which from May to October there may be typhoons and heavy rain. In 1993 the weather had been drier than usual, little rain in March, a few showers in early April and we did not encounter heavy rain until the last week of our stay.

Agrius convolvuli (L., 1758)

Norman Tong, a friend of Kent Li, has reared this species from larvae collected on an *Ipomoea* sp. and has reared them in captivity on morning glory *Ipomoea* spp.

3

PLATE III



4



1



2

(K. L. comm.). One member of this plant genus was common and flowering in profusion at Mai Po where we recorded our only sighting of this hawk-moth. The moth was in very good condition, probably freshly emerged, and sitting within the trap in the morning. Tennent (1992, 1993) found the moth fairly widespread but sporadic in Hong Kong, with emergences also noted in October, and reports that both Mike Bascombe and James Young have reared it from *Jacquemontia paniculata* (Burm. f.) Hall. f. (Convolvulaceae).

Clanis bilineata bilineata (Walk., 1866)

Tennent made the interesting observation that this species generally comes to light rather late in the night, mainly after midnight (some six hours after dusk in Hong Kong) and that the moth was regularly seen flying between 04.00 hrs and dawn. Our specimen from Long Harbour, Sai Kung, was taken in a light trap that was operated all night. K. L. found a mating pair in copulation on *Pueraria lobata* (Willd.) Ohwi (Leguminosae), a common climber, on 19 April 1991 on an open slope covered extensively with the larval foodplant, near the Outdoor Recreation Centre, Sai Kung. Previously K. L. had found an adult on 5 May 1988 at the lights of the toilet building at Hok Tau in woodland. K. L. was given a larva found by Professor Shigerue A. Ae on 19 June 1993 on *P. lobata* at Ng Tung Chai. The larva was feeding on a leaf when found and was 75 mm in length. It pupated on 1 July after a pre-pupation period of seven days and the adult emerged at 20.00 hrs on 15 July 1993.

Leucophlebia lineata Westw., 1847

The singleton we recorded, in the light trap at Long Harbour, was extremely worn. Tennent (1992) found the moth not at all common in Hong Kong, with adults in April, May and August.

Marumba dyras dyras (Walk., 1856)

One of the commonest hawk-moths in Hong Kong (Plate III, Fig. 1), according to Tennent, who reports it being found as an adult in every month from March to October. K. L. found six larvae on the undersides of leaves on several trees of *Hibiscus mutabilis* L. (Malvaceae) on 8 October 1988 on the Aberdeen Reservoir Road and a larva 25 mm in length on *Microcos paniculata* L. (Tiliaceae) on 1 May 1991 at Pak Long Tsuen. The latter formed a pupa on 1 June and the adult emerged on 24 June 1991. Young (in Tennent, 1992) has also reared larvae on both these foodplants in Hong Kong. The moth turned up every night at Wardhaven, in fresh condition, and was probably breeding nearby. We did not see it at Tai Po Kau, even though Tennent (1992) had 61 individuals there and we had one at nearby Hong Lok Yuen, so possibly it flies fairly late and is less likely to be recorded unless the trap is operated most of the night.

Plate III.

Fig. 1. *Marumba dyras*, one of the commonest hawk-moths in Hong Kong. Fig. 2. Larva of *Eupanacra mydon*. Fig. 3. *Theretra pallicosta* at Long Harbour light trap, Sai Kung. Fig. 4. *Pergesa acteus* from light of public lavatory at Tai Po Kau woodlands.



Fig. 3. Paul Waring and Kent Li examining bush of *Dalbergia benthami* and finding the eggs of the carpenter bee mimic *Sataspes infernalis*.

Sataspes infernalis Westw., 1848

Seven eggs which proved to be this species were collected by K. L. on our visit together to the woodland at Tak Po Kau on 17 April 1993. We found about a dozen in a short search and could undoubtedly have found others. Those not needed by K. L. were left in situ. We had persuaded K. L. to deviate from his usual route through the wood and climb further up the slopes. When we came upon a large bush of *Dalbergia benthami* Prain (Leguminosae) growing on the edge of a surfaced forest road (Fig. 3) K. L. showed us the technique he has used successfully to find the eggs and larvae of *S. tagalica* which he had found in eleven separate locations up to that point. He simply turns the leaves over one by one much as one would do for larvae of the broad-bordered bee hawk-moth *Hemaris fuciformis* (L., 1758) in Britain, and the preferred situation of the larval foodplant growing in full sun is evidently much the same. The large green eggs were found and assumed to be those of *S. tagalica*, but on rearing by K. L. proved to be *S. infernalis*, the first time the species has been recorded in Hong Kong. The first two larvae hatched on 21 April and the rest on 22 April, pupation dates ranged from 26 May to 3 June, and the adults emerged between 3 and 20 June 1993. K. L. has a series of photographs and notes of his experience with this species and intends to publish the material in due course (Li, in prep.).

S. infernalis was recorded by Mell (1922: 203), uncommonly, from the area around Guangzhou, China, adjacent to Hong Kong, and there are specimens in the Natural History Museum, London, from there. Although it was not seen in Hong Kong during Tennent's study, Tennent (1992) could see no reason why it should not occur there.



Fig. 4. Rachel Thomas and Kent Li finding larva of *Eupanacra mydon* on underside of leaf of *Alocasia odora*, Tai Po Kau woodlands.

Acosmeryx shervillii Boisd., 1875 form *pseudonaga* Butler, 1881

We only saw this moth at Tai Po Kau, where it turned up on both visits, but not elsewhere on the dates in between. Tennent (1992) found it at three additional localities and considered it common and widespread. It is shown in D'Abrera (1987) as *A. socrates* form *socrates* Boisd. from which it is easily distinguished by the median dark grey triangles on the underside of the abdomen (Kitching in Tennent, 1992). Like those of Tennent, ours are of the dark form *pseudonaga*.

Eupanacra mydon mydon (Walk., 1856)

This species was not seen in numbers during Tennent's light trapping but was noted nectaring in the evening and after dawn, so it may well be under-represented at light. K. L. considers the species common on the edges of densely wooded places, the borders of the reservoirs and on abandoned farmland that has been encroached by woody plants. Bascombe, Young and K. L. have found and reared the larva on *Alocasia odora* Koch (Araceae). K. L. finds that the eggs occur mainly on plants by roadsides and other edges of woodland but not on plants within dense stands of trees or amongst thick undergrowth. We found a larva in the woodland at Tai Po Kau by turning over the large leaves of the known foodplant, which was growing on the bank of a stream by a bridge, shaded overhead by mature trees. The larva was at rest along the midrib near the tip of the leaf with its head just below the tip. We photographed the larva and left it in situ (Plate III, Fig. 2 and Fig. 4). K. L. found four eggs and a larva (19 mm in length) the previous year, on 4 July 1992, in woodland by the Aberdeen Reservoir Road. One larva pupated on 15 July and the adult emerged on 28 July 1992.

Macroglossum fritzei Rothschild and Jordan, 1903

Tennent (1992) found that some *Macroglossum* species, such as *M. fritzei*, were more frequently seen at light traps than nectaring at flowers. Others are seen in numbers at dusk and dawn visiting flowers such as the golden tear-drop, *Duranta repens* L., and the introduced *Lantana camara* L. (both Verbenaceae), the latter of which was flowering in profusion during our visit. Both our specimens of *M. fritzei* were recorded at light after dark, the one at Tai Po Kau flying in at 20.00 hrs, but we saw none at *Lantana*.

Macroglossum corythus luteata (Butler, 1875)

M. corythus can be confused with *M. sylvia* (Boisd.) and *M. semifasciata* (Hampson). However *semifasciata* has a rather obvious black spot near the base of the forewing. The underside of the abdomen in *M. corythus* is light brown with small white flecks at the side of the segments. In *M. sylvia* the underside of the abdomen is dark chocolate brown with broad whitish or cream patches at the sides (I. Kitching, pers. comm.).

Both Bascombe (in Tennent, 1992) and K. L. have found larvae in the wild on *Paederia scandens* (Lour.) Merr. (Rubiaceae), commonly known as the chicken-manure creeper, a vine with a distinctive purple and mauve flower, a foul smell, and a habit of growing up over bushes in many habitats.

Hippotion rosetta (Swinhoe, 1892)

H. rosetta is shown in D'Abraera (1987) as *H. depictum* Dupont, 1941, which was synonymized by Holloway (1987). Tennent (1992) points out that it can be difficult to distinguish *H. rosetta* from *H. boerhaviae* (F.) and *H. rafflesii* (Butler) and that the latter is more common than *H. rosetta* in Hong Kong. Our single *H. rosetta* taken at Long Harbour has been confirmed by Ian Kitching, who points out that *H. boerhaviae* has longer thinner forewings, more contrast in the patterning of the forewings, deeper red hindwings and a strong and rather obvious pinkish or white line along the mid-line on the underside of the abdomen (shown in D'Abraera, 1987). It is much less frequently found in degraded habitats than *H. rosetta* and has not been recorded for certain from Hong Kong (Tennent, 1992). *H. rafflesii* can be distinguished by the orange anal angle of its hindwing.

Theretra clotho clotho (Drury, 1773)

Tennent found this a common and widespread species with adults from April to October and reports that the larva has been found and reared by Mike and Freida Bascombe on *Saurauia tristyla* de Candolle (Actinidiaceae) in Hong Kong. K. L. has also found the species commonly, with adults from April to November. K. L. informs that Norman Tong found eggs on common grape *Vitis vinifera* L. at Luk Keng and more recently on *S. tristyla* on 23 August 1992 at Ho Chung and reared these to adult. Mr Tong also found a full-grown larva on *S. tristyla* on 1 August 1992 at Jubilee Reservoir. This was reared to adult, pupating on 7 August and emerging on 21 August 1992. We only saw one individual, in good condition, at Mai Po on our penultimate night of trapping, and suspect the emergence period was just beginning.

Theretra latreillii lucasii (Walk., 1856)

Tennent found this species to be common and widespread but does not give the dates of appearance. K. L. has encountered singletons under lights at Tan Kwai Tsuen,

near Yuen Long in September 1987 and October 1988 and a third at Hok Tau on 24 April 1988. K. L. found a second instar larva on *Ludwigia caryophylla* (Lam.) Merr. & Metc. (Onagraceae) (plant det. confirmed by the herbalist Mr Lee Ning Hong) on 2 May 1992 at Ho Chung in Sai Kung. The plants were growing as weeds in wet muddy fields among rows of ginger-lily *Hedychium coronarium* J. Koenig cultivated for its fragrant flowers. This larva was reared and burrowed to pupate on 18 May, the adult emerging on 1 June 1992. On 5 October 1992 some eggs were found by K. L. on *Columella corniculata* (Benth.) Merr. (Vitaceae) (plant det. confirmed by the Hong Kong herbarium) together with a yellowish first instar larva 9 mm in length found on the young reddish leaves. As the larva grew it turned at first reddish and matched the leaves, then turned brown in the third instar. The larva pupated on 7 November and emerged on 22 November 1992. In addition larvae have been found and reared on *Ampelopsis brevipedunculata* Koehne (Vitaceae) by Norman Tong. The latter plant is a very common species. Bascombe (in Tennent, 1992) has also reared larvae on this plant and several others.

Theretra suffusa (Walk., 1856)

We saw a single fresh specimen of this species, at Long Harbour. Tennent (1992) records 58 individuals at Pak Shak O, which, like Long Harbour, is on the Sai Kung peninsula, but he only saw one or two at other localities.

Theretra pallicosta (Walk., 1856)

Tennent found this species to be widespread throughout Hong Kong, with adults from April to September but never saw the insect in any numbers. K. L. has only seen the adult once during several years of inspecting outdoor lights in a variety of locations. His specimen was taken in Tan Kwai Tsuen, Yuen Long, on 1 June 1987 at a fluorescent light in a garage. K. L. found a single larva on *Aporusa chinensis* (Champ.) Merr. (Euphorbiaceae) in mid-May in the Fung Shui woodland of Pak Long Tsuen, Lung Kwu Tan, and fourteen eggs on a small stand of the same species of plant on 3 July 1993 on the Aberdeen Reservoir Road. These were reared and the adults emerged in August. We saw only one adult (Plate III, Fig. 3) and on only one of the three consecutive nights of trapping at Long Harbour. The specimen is in good but not fresh condition although some of the wear may have been due to activity within the confines of the trap.

Pergesa acteus (Cramer, 1779)

Tennent encountered only nine adults during his 18 month survey but found it in a variety of habitats and sites including to the light of a block of flats. K. L. considers the species widespread and has noted it at lights in habitats ranging from woodland to abandoned agricultural land, including Tan Kwai Tsuen, near Yuen Long where the moth has been noted at fluorescent lights in April, June and October. Both M. Bascombe and K. L. have found and reared the larvae on *Alocasia odora* (Araceae) which is a fairly common plant that is often found by forest paths and the concreted paths that run between villages, preferring shady, moist situations by trees. K. L. found four larvae under leaves of a single plant by one such village path. The single adult (Plate III, Fig. 4) that we saw was encountered not at the light trap but on the lighted wall of the public lavatory by the roadside on the edge of the woodland at Tai Po Kau (Fig. 5).

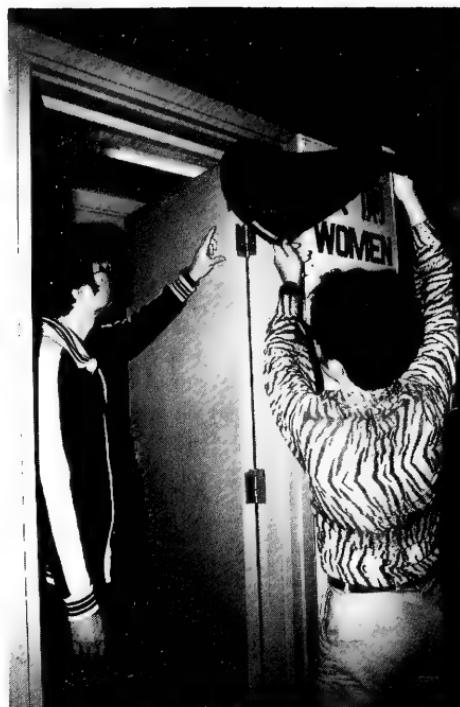


Fig. 5. Kent Li and Paul Waring collecting moths at night at lights of a public lavatory at Tai Po Kau woodlands.

Cechenena aegrota (Butler, 1875)

Although the flight season of *C. aegrota* was obviously well underway at the Tai Po Kau woodlands during the whole of our stay, it was interesting that it was not seen at any of the other sites except nearby Hong Lok Yuen. Tennent (1992) recorded it at seven widely scattered sites from the Sai Kung peninsula in the east to Lantau island in the west but our total of 27 in two nights is almost equal to his total of 33 for Tai Po Kau in 27 nights over an 18 month period. This suggests that our visit coincided with the peak emergence of this species.

K. L. has collected adults in April and July at Tai Po Kau, Hok Tau and Sai Kung Country Park. He found two eggs and two larvae in the woodlands at Tai Po Kau on wild coffee, *Psychotria rubra* Poir. (Rubiaceae), a common shrub which grows in shade on forest margins and paths at this site.

ACKNOWLEDGEMENTS

We would like to thank the following: John Tennent, for his helpful advice in planning our trip; our main hosts and travelling companions Chris and Carole Baker for all their help and hospitality which made our visit to Hong Kong so pleasant and interesting; Mike and Freida Bascombe for their generous hospitality and the loan of a light trap and generator; Tony and Jan Galsworthy for their hospitality, help with logistics, loan of trapping equipment and assistance with identifications; Dorothy Li for the hospitality at the family home; Lew Young and all the staff of

WWF at Mai Po for enabling our work on the reserve and the Agriculture and Fisheries Department of the Hong Kong Government for permission to collect in Tai Po Kau and the Sai Kung country park. Back in the UK we would like to thank David Carter, Martin Honey and Malcolm Scoble for access to the collections of the Natural History Museum, London, and Ian Kitching for checking the identifications and current nomenclature of difficult moth species. We are grateful to the library staff of the Department of Plant Sciences, University of Oxford and those of English Nature, Peterborough, for assistance with the current nomenclature of the host-plants. Special thanks are due to Kent Li, not only for his notes on the above species and for his company in the field but also for providing insights into life and entomology in Hong Kong, which we, as visitors, would otherwise have missed.

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SHORT COMMUNICATION

Some sawfly host plants not listed by Benson.—Robert Benson wrote the Royal Entomological Society of London's key to the Symphyta in the "Handbooks for the Identification of British Insects" series. It was published as Volume VI part 2 in three parts, section a (1951), section b (1952) and section c (1958). Section a has been reprinted with minor revisions by J. Quinlan and I. D. Gauld in 1981. Benson's key listed the larval host plants that were known to him; the following additional records are based on sawfly larvae collected and reared by the author, except where otherwise stated.

Athalia cornubiae Benson. Benson lists this as larva unknown in section b but adds the host plant as *Sedum album* L. in a supplement to section c. This plant is thought to be native in only a few places in the Malvern Hills and Somerset but is found widely elsewhere on old walls and buildings. There are very few records of the sawfly. On 9.x.91 a specimen of a garden hybrid *Sedum 'coral carpet'* was received at the R.H.S. Garden from a private garden in Pinner, Middx. The plant was being severely defoliated by large numbers of greenish-grey larvae. These went down into the soil in the rearing jar a few days later but no adults emerged in the following year. They were of the *Athalia* type and there is little doubt that they were *cornubiae*.

Caliroa cerasi (L.) has black, slimy slug-like larvae that are commonly known as pear and cherry slugworms. They can be found grazing away the upper leaf surface of many woody plants in the Rosaceae family. Benson lists *Pyrus* and *Prunus* species

as the main hosts, plus *Amygdalus*, *Cydonia*, *Crataegus*, *Mespilus*, *Rosa*, *Rubus* and *Sorbus* species, with two non-Rosaceae genera, *Quercus* and *Salix*. To these can be added the following records of larvae feeding on plants, all of which are in the Rosaceae family: *Amelanchier lamarckii* at the R.H.S. Garden, Wisley, Surrey, on 15.ix.93; *Pyracantha 'Mohave'* planted outside the Pelham-Clinton building at Dinton Pastures Country Park, Hurst, Berks., on 18.ix.93; *Cotoneaster horizontalis* in a private garden at Royston, Herts., on 26.x.75.

Tenthredo zona Klug. Benson describes this as sparingly common south-east of the Wash/Severn line, mainly on dry heaths and chalk downs, but gives no host plant. On 2.vi.90 two larvae were found feeding on the foliage of perforate St John's wort, *Hypericum perforatum* L., growing in chalk grassland at White Downs, near Westcott, Surrey. They went down into the soil on 4–5.vi.90 and a male adult emerged on 24.iv.91.

Pachyprotasis antennata (Klug). Benson gives *Filipendula* and *Fraxinus* as host plants. Females were reared on 3.vi.85 and 18.vi.85 from two larvae found on alder, *Alnus glutinosa* L., growing on Wisley Common, Surrey, on 11.x.84. The larvae were eating irregular-shaped holes in the margins and centres of the leaves.

Pachyprotasis rapae (L.). This is one of Britain's most common sawflies and Benson records it feeding on *Betonica*, *Scrophularia*, *Solidago*, *Fraxinus* and, added in the section c supplement, *Antirrhinum*. On 22.vi.83 larvae were found on plants of *Stachys officinalis* 'rosea' growing at the R.H.S. Garden, Wisley, Surrey. Nearby plants of *Stachys macrantha* were unaffected. The larvae make irregular holes in the foliage, mainly in the centre of the leaf rather than at the margins. A female emerged on 15.v.84.

Pachyprotasis variegata (Fallen). Benson gives the potato, *Solanum tuberosum* L., as a host plant and also notes that it has been found feeding on the Continent on *Digitalis lutea* L. Larvae were found feeding on the foliage and flowers of rough hawkbit, *Leontodon hispidus* L., growing at The Sheeples, near West Horsley, Surrey on 4.vii.81. A female emerged 29.iv.82. Larvae were also found at the same site on 3.viii.85 feeding on the flowers of ox-eye daisy, *Leucanthemum vulgare* Lam. A female emerged 29.v.86. Like many other members of the subfamily Tenthredininae the adults of *P. variegata* are predators of other small insects. One female readily ate the small fly and a larva of the hawthorn webber moth, *Scythropia crataegella* (L.), that it was offered.

Macrophyia albicincta (Schrank). Benson included this species in his key but it was later realized by Chevin, H. (*Annls Soc. Ent. Fr. (N.S.)* 1975; 11: 253–260) that this was in fact two species, *albicincta* (Schrank) and *alboannulata* Costa. Benson gives the host plants for his *albicincta* as *Sambucus nigra* L. and sometimes *Valeriana officinalis* L. The food plants given for the split species are *Sambucus* species for *M. alboannulata* and *Sambucus* species and *Valeriana officinalis* for *M. albicincta*. On 21.vii.84 solitary larvae were found making rounded holes in the leaves of guelder rose, *Viburnum opulus* L., in Baynes Wood, near Greenham Common, Berks. Several males and females of *Macrophyia albicincta* (Schrank) were reared between 24 and 30.iv.85.

Priophorus pallipes (Lep.). This common species is recorded by Benson as feeding on various Rosaceae plants such as *Crataegus*, *Fragaria*, *Prunus*, *Pyrus* and *Sorbus*, and also on *Betula*. On 11.ix.92 plants of red chokeberry, *Aronia arbutifolia*, on sale at a garden centre at Mayford, near Woking, Surrey, were having their foliage extensively holed by this sawfly. This North American plant is in the Rosaceae family. A female emerged on 1.x.92; normally larvae found late in the year will overwinter as prepupal larvae and adults emerge during May–June.—A. J. Halstead, R.H.S. Garden, Wisley, Woking, Surrey GU23 6QB.

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